

amateur radio

NOVEMBER, 1974



Despite a lot of talk recently that the component industry in Australia is finished, at least one factory in Melbourne is in full production of capacitors. This particular machine is winding metallised paper capacitors for the telephone industry.

Photo: VK3ACA

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SPECIAL INSERTS —

Oscar 5 Standard Orbitals
Call Sign Amendments
VK2 WICEN and Broadcast Zones

GRID DIP METER SPECIFICATION



Model TE-15
Freq. Range: 440kHz-280MHz
in 6 Coils
A Coil 0.44-1.3MHz
B Coil 1.3-4.3MHz
C Coil 4.14MHz
D Coil 14.40MHz
F Coil 120-280MHz
Transistor: 3 TR's & 1 Diode
Meter: 500uA Fa.
Battery: 9V (BL-006P)
Dimensions: 180x80x40mm
Weight: 730g

Price \$36.50
P & P \$1.00

DELUXE AUDIO GENERATOR SPECIFICATION



Model HE-22D
Model TE-22D
Freq. Range: Sin: 20Hz-200kHz
Square: 20Hz-250kHz
Output Voltage: Sin: 7 volt.
Square 7 volt
Output Impedance: 1000 ohm
Freq. Accuracy: $\pm 3\%$, $\pm 2\%$
Distortion: Less than 2%
Tube Complement: 6BM8
12 AT7, 62A
Power Source: 105-125V, 220-240V AC, 50/60 cps, 19W
With Attenuation Range
4 Ranges—1/1, 1/10, 1/100,
1/1K

Price \$49.50
P & P \$2.00

Compact-Space Saving
Printed Circuit for uniform
Characteristics
Low Distortion
Dimensions: 140 x 215 x 170mm
Weight: 2.8kg.

Disposal Specials — Richmond only

Crystals

- | | |
|---|------------|
| 1 MHz D style | ea. \$8.00 |
| 100 kHz 7 pin glass enclosed | \$10.00 |
| Most popular D style for 2 m FM channels 1, 4, B, 50 etc. | \$6.50 |
| 58 ohm new 1/2" diameter coax cable | \$10.00* |
| 12c/yard or 100 yd | \$3.00 |
| Tank whip antenna bases, new | \$3.00 |
| Selsyn motors, 50 volt, new | \$5.00 |
| PMG phone plug and socket, | |
| Ericsson type, per pair | 95c |
| Phone curly cords, cream | 30c |
| Rocking armature mic, insert | 30c |
| Key switches, various types, 50c & 75c | |
| 4/125A Ceramic valve socket | \$2.00 |
| 7 pin PTFE valve socket with screw-on shield | 98c |
| 9 pin as above | 98c |
| Polypak 100 mixed resistors 1/4W-2W all new | \$1.90 |
| Polypak 30 assorted capacitors, ceramic, electrolytic polyester, all new | \$1.50 |
| Switches, 11 position, 2 pole, 2 bank ceramic | \$1.50 |
| Switches, 4 position, 2 pole | \$1.00 |
| 8 transistor radio circuit board with all components and battery holder ready to go straight from production line | \$3.00 |
| 6 transistor, as above | \$2.00 |

LAFAYETTE HA-600A SOLID STATE

GENERAL COVERAGE

- 5 BANDS 150-1000 kHz, 550-1500 kHz (Broadcast band), 1.6-4.8 MHz, 4.8-14.6 MHz, 10-530 MHz.
Operates from 12 Volts DC (negative ground) or 220-240 Volts 50 Hz.
• Field Effect Transistors in RF Mixer and Oscillator Stages.
• Two Mechanical Filters for exceptional selectivity.
• Voltage Regulated with Zener Diodes.
• Product Detector for SSB/CW.
• Edge illuminated Slide Rule Dial with "S" Meter.
• Continuous Electrical Bandspread Calibrated 80-100M Amateur Bands.
• Variable BFO, Automatic Noise Limiter.
• Speaker Impedance: 4 to 16 ohms.



Price \$215.00
P & P \$2.00

Also available — HA800B Amateur Band, 6 Bands 3.5MHz to 29.7MHz and 50-54MHz as above features with 100kHz calibration facility: \$219.50, 1990kHz Xial Extra \$10.75. P & P \$2.00

SOLID STATE WIDEBAND RF SIGNAL GENERATOR

MUSEL RS-475

This is an all solid state, wide-band RF Signal Generator which produces low impedance low distortion RF signals. It is highly dependable and easy to operate, and is a handy working instrument for service benches and electronic equipment production centres.

SPECIAL FEATURES

1. Generates wide range signals from 100kHz to 10MHz in six frequency ranges.
2. All solid state construction for instant waveforms, compact and lightweight portability.
3. Includes 400kHz signal source for modulation of output signal, which can be modulated by external sources.

Price \$99.50. p & p \$2.00

Disposal Specials — Richmond only

- | | |
|--|---------|
| 5BP1 CRO tubes, new | \$3.00 |
| Headphones, low impedance, ex-Army | |
| In sealed box, pair | \$2.00 |
| Tag strips, 7 lug plus 2 mounting lugs | |
| 10 for | 50c |
| Egg insulators, porcelain, new, ea. | 12c |
| 20 amp DC meter in wooden carrying case | \$10.00 |
| Telephone hand set with PTT switch, ex-Army | \$1.50 |
| Coin formers, 1 1/4" with octal plug, | |
| 40 cents each or 3 for | \$1.00 |
| No. 19 and 62 transceivers, partly wrecked, any reasonable offer accepted. | |
| Personal shoppers only. | |

TRIO 3" OSCILLOSCOPE DC — 1.5 MHz MODEL CO-1303A

SPECIAL FEATURES

1. Vertical sensitivity of 20 mV/cm, three step attenuation, AC DC operation & wideband frequency response from DC to 1.5MHz.
2. DC vertical and horizontal amplifiers for wide versatility make possible external sweep speeds of less than 1Hz.
3. All solid state construction for compact, lightweight portability.
4. Smoked filter glass CRT face and exclusive designed graticule, graduated in dB for clear waveform comparisons.
5. Direct input to 150MHz for SSB and AM transmission monitoring.

Price \$150. p & p \$2.00

DISPOSAL SPECIALS

Coax. Cable, 58 ohm Ascend
15 P1/24. Brand new 1/2" outside diameter. 12c per yard, \$10 per 100 yard reel.

AWA BEAT FREQUENCY OSCILLATOR
from Zero Cycles to 13 kHz,
240 Volt AC \$35.

PLESSEY TRANSCIVERS
in stock at present include
B47, B48, C42, C45 with power supplies and accessories also available.

Brand new valves and semiconductors

- | | |
|-----------------------|--------|
| 2N3055 | \$1.00 |
| OA91 | 15c |
| 807 | \$2.00 |
| 1T4, 6C8, 1R5 | 75c |
| 6BA6-6AK5-6V6G-6J6 | \$1.00 |
| 2E26-QQE04/7-QQE04/10 | |
| 6SK7-ECH35-6K8G-5763 | \$3.00 |
| 6SJ7GT-12AT7 | \$1.50 |

HAM RADIO (Disposal Branch)

104 Highett Street, Richmond,
Vic., 3121 — 42 8136

HAM

RADIO SUPPLIES

323 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones: 67-7329, 67-4286 All Mail to be addressed to above address

Our Disposals Store at 104 HIGHETT ST., RICHMOND (Phone 42-8136) is open Mondays to Fridays, 10.30 a.m. to 5.5 p.m., and on Saturdays to midday.

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA, FOUNDED 1910

QSP



NOVEMBER, 1974

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Registered at the
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LICENCE FEES

Since the Government doubled licence fees for the Amateur Service in the recent Budget, strong representations have been made by the Executive through both Governmental and Opposition channels. Letters were immediately written to the Treasurer, Post-Master General, Minister for Defence and Deputy Leader of the Opposition spelling out our objections to the licence fee increase and the hardships and unwarranted imposition which this placed upon all amateurs in Australia. Replies, as at time of writing, have been received from the Post-Master General, Minister for Defence and the Deputy Leader of the Opposition.

On the Governmental side, the replies have indicated the matter has now been referred to the appropriate authorities for examination. The Deputy Leader of the Opposition, Mr. Phillip Lynch, replied that he had made urgent representations on behalf of the Institute to the appropriate Ministers and had also referred the matter to Senators Guilfoyle and Durack, both of whom have Opposition responsibility in the areas to which we referred.

It is to be hoped that these representations, together with those made by individual amateurs through their local Members will result, at the very least, in restoration of the old \$6 licence fee.

The importance of individual amateurs raising this subject with their own Member cannot be stressed too strongly.

Only by each and every amateur raising his or her voice in protest can we hope to impress upon the Government the full significance of this increased cost.

It would be a great shame if even one amateur were forced, through these economic considerations, to abandon a hobby which provides, on the one hand, great enjoyment and a contribution to international understanding and, on the other hand, the potential for providing valuable emergency communications, the need for which can never be forecast.

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DIVISIONAL BROADCASTS

Do you have the time and want to keep in touch with events? If so here are the latest details available of Divisional broadcasts.

VK1WI
Sundays 10.00 Z.—
3595 kHz
27125 kHz FM
146.5 MHz FM
BC Committee VK1VTP, IMP, 2VB/1.

VK2AWS
11.00 local time Sundays:
3595 kHz AM
7146 kHz SSB
52.525 MHz FM
53.688 MHz AM
146.13 MHz FM
Hunter Branch Mondays 19.00h 80m.

VK3WI
10.30 local time Sundays:
1425 kHz AM
3400 kHz SSB
7146 kHz SSB
146.5 MHz FM
Ch1 FM
(subject to availability at present of relay stations whilst under re-location).

VK4WI
09.00 local time Sundays:
3595 kHz AM
7146 kHz SSB
146.13 MHz FM
re-broadcast on Ch 9 FM. BC officer VK4IB.

VK5WI
23.30Z Sunday mornings originating on 1.8 MHz band and relays as follows—
3.615 MHz by VK6ZQ
7.125 MHz by VK5NB
14.170 MHz by VK5TY
82.2 MHz by VK5ZEG
Ch 48 by VK5WB
VK6CM in Darwin on 2m
VKSOK in Mt. Gambier on 2m

VK6WI
09.30 local time on Sundays:
3595 kHz AM
7080 kHz SSB
14100 kHz SSB
82.650 MHz FM

VK7P
08.30 local time on Sundays originating on Mt. Garraway 2m re-broadcast VK7RAA and re-broadcast in Launceston area 3672 kHz SSB, 7130 kHz AM and in Hobart area on 53.932 AM, 144.1 MHz AM, 146 MHz FM and 432.1 MHz AM.

THERE MUST BE SOMETHING HERE THAT YOU WANT FOR CHRISTMAS

Books — Here's your chance to become a real expert or take up something new as the Christmas season approaches. We have the best selection anywhere because we actively study what's available all over the world. We can therefore confidently recommend the following:

Radio Amateur Callbook (USA) gives an alphabetical directory listing of names and addresses for every radio amateur in the States. Possessions and personal overseas. Over 283,000 K and W calls are listed. New edition just published has over 800 pages. (P&P \$1.00) **\$8.85**

Foreign Radio Amateur Callbook (DX Listings) covers over 211,000 radio amateurs outside the USA. Companion volume to above. Latest edition runs to over 400 pages. (P&P \$1.00) **\$6.95**

Get the two volumes for just **\$16.00** (P&P \$1.00), saving you over \$4 on combined purchase.

Radio Amateurs Prefix Map of the World. Specially designed for the shack and must be the centre-piece. Printed in 4 colours. Shows 40 DX zones, plus continental boundaries, time zones, alphabetical listing of prefixes and countries, continents and DX zones. (P&P 50 cents) **Only \$1.50**

Radio Amateurs World Atlas. The only one of its kind. Contains 11 maps including all continents (Antarctica etc.). Uses Lambert Azimuthal equal area projection. Each map shows continental and zone boundaries plus country prefixes. Ideal for field trips and DXers. 4 colours, 20 pages 9 in. by 12 in. approx. (P&P 50 cents) **\$3.00**

Radio Amateurs DX Guide. A wealth of information — International DX log, World Map with prefixes. Time tables, etc. 54 pages. (P&P 50 cents) **\$3.00**

A Course in Radio Fundamentals — ARRL 28 chapters for home study. Starts from basic theory, goes right through to feedback, etc. **\$3.75**

The ARRL Antenna Book — An accumulation of years of amateur experience. 5 Chapters of theory plus chapters on various designs. **\$4.25**

Hints and Kinks — ARRL — If you've got a small amount of money and a good junk box, then away you go! Hundreds of clever ideas. **\$2.90**

The Radio Amateur's Operating Manual — ARRL — Written for those who must have the finest technique. 8 chapters cover all aspects. **\$3.50**

RF and Repeaters for the Radio Amateur — ARRL — A good guide written by amateur experts. Wealth of information plus special jargon section. **\$4.75**

888 for the Radio Amateur — ARRL — A digest of articles from QST tells all about Theory and Practice. **\$4.75**

The Radio Amateur's VHF Manual — A thorough treatment including history, Principles, circuits, test gear, etc., with a practical emphasis. **\$4.25**

Learning the Radioteletype Code — ARRL — Uses the 'Sound' conception method which greatly simplifies code learning. **\$1.00**

NEW! The Radio Amateur's Handbook — Latest edition of this widely used book, 25 chapters. Text-book. Data book, Construction Manual. The reference book. **\$6.50**

The World Radio and TV Handbook — The complete directory. 400 pages giving complete and exact info. on every one EVERY transmitting station in the world. SWL's were queuing up for this one when they first arrived. Useful DXers reference book and many sold to professional radio people. (P&P 75 cents) **\$5.75**

XYLs/Girlfriends/Wives/Lovers — We know how difficult it is to compete with his hobby, but we have info. on every one EVERY transmitting station who does appear to you, they will be him!

US Radio Amateur Callbook and Foreign Radio Callbook are listed elsewhere. You can use them to do his QSLs and you'll have something like half a million names and addresses. Failing that you could correspond with their XYLs!

Radio Amateur's Prefix Map. also listed earlier, makes a good excuse to venture into the shack or even get him to tidy up. It's colourful, 29 in. by 40 in., and only **\$1.50**. At least you'll be able to know where the call signs come from.



Ham Notebook has rapidly established itself as essential because it is full of handy tips. Learn a few off by heart or read them to him, you'll be amazed at the effect. This book has been compiled from the top US magazines, 10 chapters, 176 pages. When he congratulates you, tell him Dick let you have the book for only **\$3.50** instead of the usual \$4.50 as a Christmas gift!

One final word, don't tell the OM you read this column, it may upset him.



POWER SUPPLY suitable for use with 27 MHz transceivers and IC22. Fully regulated 12V @ 3A, 240V main **\$32.90**



Kenwood TS-520 — 160W, SSB transceiver covers 80 to 10 metres. Features noise blanker, VOX, DX switch, 8 pole crystal filter etc. etc. Has fully transistored receiver with 0.5uV sensitivity on 80 to 15M. Stability is 100Hz per 30 minutes after warm up. Has one IC, 15FETs, 44 transistors, 84 diodes and a 3 tube line up. Heavy duty die cast construction protects components and ensures lasting stability. Operates on 13.5V dc or 240V ac for mobile and field operation. Too many features to list. Call in to Gore Hill and see one. You'll want one at **\$543.00** (DRO Freight extra).

VHF EQUIPMENT

Icom IC22 144-148 MHz. FM transceiver has power outputs of 1W and 10W. The 22 channels all have separate trimmers. Deviation 5-15 MHz. Features solid state Tx/Rx relay, large built-in speaker, MOSFET front end with 5 helical filters, noise cancelling mict., quick disconnect mobile mount. And if the spec doesn't grab you, the looks will. Got green back lighting, special transmit light and even a light to tell you of incoming signals. If the volume is turned down. Supplied complete with workshop manual and accessories right down to a silicone cloth to keep the set like new. Fitted with one set of crystals for 144.000 or 146.5 MHz (please specify). Normal price is \$249 but we are introducing them at only **\$189.00**, freight anywhere for only **\$3.50** including insurance.



Kits — Knock one of these popular kits up over your holidays. 30 Watt VHF Amplifier intended for 2 Metres but easily adapted to 6M. Only 300mV in gives a full 30W out from a 12.5V supply. Ideal for mobiles. Uses the ultra-robust 2N5389/90/91 (2N5390 stage not needed for 6M).

7 Watt stage 2N5589 **\$12.50** complete
15 Watt stage 2N5580 **\$14.50** complete
30 Watt stage 2N5581 **\$18.50** complete

All three stages together for only **\$38.50**. If building 6M version please request instructions.

200MHz Counter Kit (E.A. Dec. 73) fully solid state with 4½ decade readout by 7 segment LED displays. Leading zero suppression. Internal crystal timebase or external calibration as required. Inputs from 50mV to 10V rms into 10M across 50pF. Definitely the best value possible. Basic 200MHz counter **\$118.00** or with preselector for full 200MHz use **\$138.00** (P&P \$2.00).

Digital voltmeter (E.A. Oct. 73) uses the Analog Devices 3½ digit panelmeter with an accuracy of 0.05% plus or minus 1 digit. Covers 20mV to 2kV and 20 ohm to 200k. Complete kit **\$146.00** (P&P \$2.00).

Note: Both the instruments are supplied with pouch cases and front panels so that their appearance lives up to their performance.



FET Multimeter Special — Constant 100µV input impedance, 27 ranges, battery operated, complete in vinyl case. The famous Jeyem L55 in our catalogue last year at **\$45.50** slashed by **\$10** just for the first 100 readers before Christmas. Check catalogue for impressive spec, then hurry and save **\$10**. Price is now **\$35.50**. Special probes to suit but only limited quantities at these prices.

RF Probe **\$6.50**, Temperature Probe, was **\$11.00**, now **\$6.50**, 30kV probe, was **\$11.00**, now **\$8.00**. **HURRY, HURRY!**



Catalogue — Dick's new catalogue was published in October's Electronics Today. If you haven't got a copy send 30 cents towards P&P. Catalogue is the usual small print 64 pages. To print it like the other would require around 4 times as many pages which we couldn't afford, so get a magnifying glass. Three pages for Amateurs alone plus all the useful bumph you need but can never find. 50 cent vouchers, Mail Order form etc., etc. Send now

Dick Smith Electronics
160-162 Pacific Highway
Gore Hill, 2065 439 5311

Also at 341 Home Highway, Bankstown (100yds from Tel 799 6400 Chapel Road)

Dick please send me a copy of your new 64-page catalogue. I enclose 30c towards post and packing.

Name _____

Address _____

Postcode _____

QSP WARNING! RAPID PRINTED CIRCUIT BOARD ETCHING

In recent weeks items have appeared in electronics magazines suggesting the use of a mixture of Hydrogen Peroxide and Hydrochloric acid as a rapid etchant for printed circuit boards. Both chemicals are dangerous in themselves but when mixed and a copper board added an exothermic (heat generating) reaction is started which can go into thermal runaway — with explosive results. The results of flying glass and boiling acid on the surroundings (i.e. you) are too horrifying to contemplate.

Even given that the mixture might not explode, chlorine gas may be given off and the results of inhalation of even a small amount are nasty and lasting. (Chlorine was used during W.W.I as a poison gas).

The amateur would be well advised to stick with Ferric Chloride solution as it is safe (provided you don't splash it in your eyes or try to drink it) and stable. At room temperature with fresh solution a board should etch in about half an hour and if the solution is warmed etch times as short as 5-10 minutes can be achieved. Do not boil though, as nothing is gained and it tends to split.

R. Roper

ALLOCATION OF FREQUENCIES

One of the potentially controversial claims made by the 'Third World' (less developed) countries, supported by Chile, at the WARC (Maritime) in Geneva a few months ago relates to the joint ownership of the radio frequency spectrum by all countries. It appears that these countries actively dispute the historical development of the international allocation system which gives first users the right of protection against newcomers. How far this philosophy will spill-over into allocations not directly relating to the maritime service cannot of course be predicted with any great precision but if it does the amateur bands might present a tempting target. Certainly the 7 MHz amateur band might well be claimed to belong to those broadcasting stations which have populated it for so long by the time WARC 1979 approaches.



UHF TV

The ABCB has announced channelling arrangements for UHF television as a first step towards the future introduction of some TV services on UHF. The UHF channels extend from Channel 28 (528-543 MHz) to Channel 34 (574-582 MHz) in Band IV and from Channel 39 (614-622 MHz) to Channel 63 (806-814 MHz) in Band V and are slated to supplement the existing 13 VHF channels. The non-continuous numbering system arises from the desirability of arranging for uniformity between Australian channels/frequency allocation and the present overseas practice. It is stated. No UHF transmitting has so far been authorised but the need to do so for new types of TV services might arise in possibly 5 years time. In the shorter term, however, the Board would be authorising UHF transmissions to supplement VHF transmissions for "fill-in" type services. No new services, it is said, will use Channel 5 in the future in accordance with the FM inquiry recommendations and many existing services on this channel will have to change to an alternative channel to make way for the introduction of FM broadcasting.

CALL-SIGN PREFIXES

The following call-sign blocks have been allocated: A9A-A9Z Bahrain; C4A-C4Z Republic of Cyprus; H3A-H3Z Republic of Panama. The Republic of Gambia has become the 147th member country of the ITU. XV5AA, XV5AB and XV5AC have been authorised to exchange radiocommunications with other amateur radio stations outside the Republic of Viet-Nam. Radio Comms. Aug. '74.

RECEIVERS

Pat Hawker G3VA in TT (Rad. Comms. Aug. '74) discusses some of the valid reasons in favour of home-brew HF communications receivers quite apart from any natural sense of achievement that comes from such a project. "Just as teenagers can build a performance car that will outperform Detroit's creations on the drag strip, many an amateur can build a better receiver than he can afford to buy. Yet too many of the designs in amateur journals are imitations of commercial designs and although giving their builders valuable experience too often result in an inferior receiver at a higher cost".

BOOKS OF INTEREST FOR AMATEUR OPERATORS

Electric Guitar Amplifier Handbook — W. C. Cook	\$7.65
Transistor-TV Servicing Guide — Robert G. Middleton	\$4.70
Transistor Substitution Handbook No. 14 — Sams	\$3.25
TV Servicing Guide — Arranged by Trouble Symptoms — Leslie D. Deane & Calvin C. Young, Jr.	\$4.00
Electronic Organ Servicing Guide — Robert G. Middleton	\$5.45
Radio Handbook, 19th Edition — William I. Orr	\$14.95
Colour Television Theory — Hutson	\$11.70
Single Sideband for the Radio Amateur — A.R.R.L.	\$4.85
PAL Colour Television for Servicemen — W. C. Cook	\$15.00
VHF Handbook for Radio Amateurs — Herbert S. Brier & William I. Orr	\$6.60
99 Ways To Use Your Oscilloscope — Albert C. W. Saunders	\$4.95
Transistor Audio Amplifiers — Jack Darr	\$6.05

ADD POSTAGES: LOCAL 45c
INTERSTATE 75c

McGILL'S AUTHORISED NEWSAGENCY

Established 1860

187-193 ELIZABETH STREET, MELBOURNE, VIC., 3000

"The G.P.O. is opposite"

Phones 60-1475-6-7

A Sheet Metal Bender

Reprinted from Zero Best, December 1969

Simple construction and usefulness are combined in this easy to make machine which will bend the softer metals up to 18 gauge and the harder metals up to 24 gauge.

The length of the machine must be determined by the constructor having in mind the largest chassis likely to be required, so plan the size accordingly. The nominal measurements are for 24 inches long overall, giving a bending length of approximately 20 inches.

THE FOUNDATION

The wooden foundation pieces are 1½ inch thick and should be of well seasoned hardwood; the base is 5 inches wide, the hold down 3 inches and the bender 2½ inches wide. Note that the inside edge of the hold down is bevelled to a slope of approximately 80 degrees (the metal edge too) to allow for the natural spring back exerted by metal when bent in length. If the bender is brought tight against the bevel, the metal when relieved of pressure, will spring back to a right angle. The wooden surfaces that come into contact with the metal to be bent are covered with iron, or mild steel, either fully or by 2 inches x ½ inch flat, fixed with counter sunk screws set slightly below the surface. If the strip is used rather than the full plate, then build up the surface flush with the metal by using ½ inch masonite fixed with glue, nails or counter sunk screws.

The hinges must be robust and free from wobble, so obtain a good pair. A slight clearance must be made in the wood to accommodate the knuckle of the hinge. The hinges may well be fitted before the wooden surfaces are covered, as the two edges must bind as closely as possible to ensure a clean bend. This part is probably the most important so exercise care and accuracy in fitting.

THE HOLD DOWN

This rides freely on two ¾ inch bolts which are a fixture in the base. Hexagon heads, let in, are ideal. The centres are set about 2 inches in from the front edge and from the side. A steel washer under each wing nut will make tightening easier. Slots are required in the hold down for

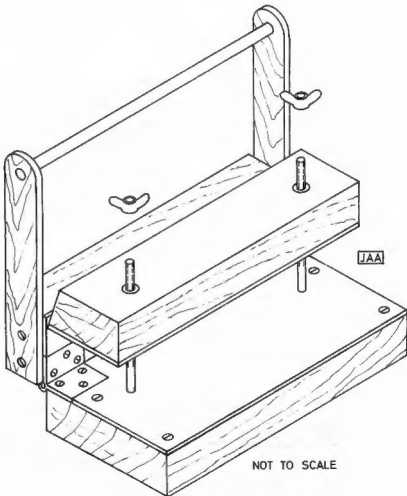
box forming and should be approximately 1½ inch deep. The distances apart are determined by chassis size required and can be put in as required.

Two blades in a hacksaw frame (teeth of each blade opposite to each other) will give sufficient width. The slots are cut into the bevelled edge.

Alternative to cutting slots, a narrow piece of ½ inch mild steel could be used, the slots being cut into the wood with

a wood saw then the metal cut to length, ends squared and fastened, with a gap, to correspond with the slots in the wood. (Or a number of different length hold downs could be constructed.)

The bender is lowered to a horizontal position and the work allowed to project over the edge of the base as is desired. The material is then clamped with the hold down and the bender pulled up to a vertical position.



NOT TO SCALE

SSTV Scene — 1974

Since earlier articles in AR were published, the popularity of SSTV in Australia has been little short of fantastic. The amount of video coming from Australian shacks is on the increase daily. There are, at this time, more than sixty stations with monitors.

To help those interested in venturing into this field, it was thought wise to let all know of the present state of the art in Australia and overseas.

Import duties make the procurement of commercial equipment quite out of the question for most amateurs. Hence most SSTV equipment used in Australia is of the "home brew" variety.

The need to provide help to would-be Slow Scanners was realised by the Eastern and Mountain District Radio Club (EMDRC) SSTV group, and thus the ground was prepared to provide "State of the Art" printed circuit boards and designs around available commonly procurable local components. To date, the group can supply at cost, printed circuit boards for X51 monitor, X52 camera, SSTV master sync pulse generator, Fast Scan to Slow Scan Sampler, and Video Keyboard.

All of these boards will be supplied with circuits and component details. It is emphasised that these boards are the result of a tremendous amount of research culminating in a finished product which, with

little effort, is right up to the state of the Art.

MONITORS

The earlier monitors derived their sync and raster from the distant station and thus when sync was not forthcoming the screen remained blank. It was not long before monitors began to appear whose locally generated ramp generators were synchronized to the incoming video.

This gave the added benefit of a continuously painted raster and even when a slight loss of sync did occur, video information would still be presented in a very recognisable form, and in some cases one would not realise that any disturbance had occurred. Sync derivation techniques improved to allow for better signal to interference ratio. The earlier development of toroidal tuned circuits to extract the 1200 Hz sync pulse has given way to the physically compact use of active filters using operational amplifiers. Some circuits go even further and use phased locked loops. However, this idea has not received as much attention as it deserves.

The X51 monitor board will provide the constructor with the major back-bone for a monitor. It is fully solid state using Operational Amplifiers extensively and commonly available components. The only additional components required to complete the monitor are a CRO tube, EHT supply and basic power supply (+ and — 15 volt regulators are already on the board).

The original use of P7 phosphor tubes (5BP7, 5FP7, 7BP7 etc.) was alright, how-

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9 Bulbul Street, Ludmilla, Darwin

ever, the availability of these tubes now is a problem. Also, deflection and focusing coils were an additional problem as these are likewise very hard to obtain.

The SSTV group realising this problem, approached a TV tube re-gun manufacturer for an alternative. The outcome was a major breakthrough for the Australian SSTV exponent. After much testing, an E26 phosphor was developed which could be inserted in any TV glass ware. The finished product is a brand new guaranteed tube with a phosphor which could be viewed in relatively bright lighting (Twin 40W fluorescents) something which was only a dream with the P7 phosphor.

At present we are awaiting further tests on several new phosphors imported from the UK. These have very interesting possibilities and hopefully we may be able to further improve the E26 phosphor, which has a very slight tendency to smear and cause slight loss in picture definition compared with the P7 style of phosphor.

Additionally the bright trace was eliminated from the picture during scan. The picture colour is a reddish orange, but after viewing for a short time one quickly adapts to this colour against the green nature of the P7 phosphor. An 11 inch tube can be supplied "off the shelf" for approximately \$26.50 plus packing. Eight inch tubes are now a little hard to come by, due to glassware problems. This is most likely caused by TV stations standardising on larger video monitors. However, if you can obtain a tube of smaller dimensions with an intact envelope, EMDRC will re-phosphor and re-gun this for you. The most common size of picture raster depends upon the viewing distance, but normally a 6 inch square picture is satisfactory, and going above this size will tend to cause degradation in the picture due to the line spacing.

By using the TV picture tubes, standard focusing, deflection and EHT component parts are used. The normal EHT requirement for this phosphor is about 13.5 kV. This is a compromise between brightness and persistence. **A word of warning:** the screen will burn instantly if a spot or a high intensity picture is left on the screen for any length of time. However, the X51 monitor has "spot kill" and line deflection failure circuits inbuilt for tube protection.

After one has completed his monitor and has overcome his excitement of receiving high quality pictures from all over the world, he quickly wants to get amongst it and send his own video. Probably he has approached one of the SSTV operators and has his CQ call, name and QTH on tape to attract attention, but it's not the same as sending what he wishes when he wishes. Now he faces the decision of how



Doug VK8KK with home-built slow scan monitor at lower left, fast scan monitor above, Akai tape recorder, and FTDX490 transceiver.

to tackle the problem. He has the basic choice of three directions:

1. Flying Spot Scanner.
2. X52 type of Camera.
3. Fast to Slow Scan conversion technique.

Taking them one by one.

The Flying Spot Scanner can be broken down into two types. "See through" and "Reflective". The "See through" type places the scanned subject between the raster tube and the photo multiplier and is naturally a transparency. The reflective version places the image to be scanned in front of the raster which is focused upon the image. The reflected light intensity is picked up by two photo multipliers placed in front of the lens.

Out of the two, the reflective system is by far the most flexible, enabling the average amateur to find transmission data from books, etc. or his own pen drawings of the appropriate size.

The other method requires the amateur to dabble in photography and thus limits his capabilities. Both systems give the same picture quality. The electronics behind a Flying Spot Scanner are very simple and basic. They would also be by far the most inexpensive. The metal work, etc. in the construction requires a bit of a workshop and poses the biggest headache.

When building a Flying Spot Scanner, several operators have run into smearing definition problems. This has been due to the phosphor of the raster tube. 3BP7, 3BP7 and the like as generally used for this purpose rely on the fast phosphor (the bright blue trace—not the green afterglow) which allows for a fast rise and fall time used in scanning. However, during their time of manufacture (WW2) the prime objective was to produce the "P7" phosphor i.e. the long persistence, and the "excitation phosphor" was not always of a fast writing type. The author has had experience of having three 3BP7a by the same manufacturer produced within a four month period giving completely different results. Only one tube was satisfactory. If you have a smearing or similar problem, this could be your trouble.

Incidentally, while talking CRO tubes, we in VK are trying to convince overseas manufacturers to change the 1:1 picture format, for the standard 4:3. Even the foremost manufacturer of SSTV equipment uses a 4:3 tube but masks out the remainder of the unused tube. Of course, as previously mentioned, the large majority of VK monitors use TV tubes, and technically there are only advantages to be gained. The only drawback being those using old CRO tubes which give a smaller overall picture. It will not be long before these surplus P7 tubes will become extinct.

Some amateurs would be quite happy to stop at a Fast Scan Sampler and put up with its draw-back of having to prepare all material which is to be sent beforehand. However, the bug normally bites to own a camera and shoot scenes at random.

Improvement always means added expenditure and increased technical finesse!



Example of digital video — produced from home-built keyboard of VK8KK.

Thus we move onto cameras.

X52. This is similar to the commercial SSTV cameras and it derives all its voltage requirements from its matching monitor. It is technically a "fast scan" camera with inbuilt sampling. One should not confuse the term fast scan as related to normal TV transmissions, as the term indicates. However, it runs at a 4 kHz rate, which is then sampled. It can be seen from this that a "fast scan" output is not compatible with normal TV monitors, and thus cannot be displayed on same. Most commercial SSTV systems employ this technique though lately a new brand has come out with the true fast scan sampled camera. The only draw-back with the former system (4 kHz sampled) is that all set up focusing, lighting etc. must be carried out observing your slow scan monitor. This can be frustrating and time consuming, waiting for adjustments to be seen on each subsequent 8 second frame.

However, all is not as dark as might appear. With additional circuitry your CRO (if you own one — almost essential for SSTV) can be used to display the 5 kHz picture. It is quite acceptable and allows for instant focusing and set up.

Most SSTV manufacturers advertise a "fast scan" adaptor and in nearly all this is what they refer to.

THE TRUE FAST SCAN SAMPLED TECHNIQUE

Here again the amateur is faced with the most important immediate criterion — cost. What is required is a normal fast scan camera as used in a store security set up. It is possible to obtain one of these if one keeps his ear to the ground and is in the right place at the right time. You could be lucky to obtain one with its own monitor or else an old standard TV receiver will suffice. It is not necessary to have an RF output but one has to bring out the video. Incidentally, having procured a fast scan camera, it opens up the possibility of using this for fast scan transmissions on UHF.

The techniques here have been made very simple, and a fast scan to slow scan converter PC board of latest design is available, with a master sync pulse generator board, from the SSTV group.

By using this technique you can in-

stantly switch from FS to SS without defacing your FS camera (you may wish to sell it later) and at all times watch your picture for alignment. In the slow scan mode your fast scan display will tend to flicker slightly (due to the 16 2/3rd Hz frame rate) but is perfectly readable with very little degradation.

Before leaving video generation techniques, a word about SSTV FM modulators. Some of the older circuit's use discreet component multivibrators. These are extremely hard to set up and to hold their settings. The latest thing is the NE566 which is a voltage controlled oscillator and the implementation of one of these plus an Operational Amplifier low pass filter will provide a very stable modulator.

OVERSEAS TRENDS

Most stations you exchange video with outside Australia will be using commercial equipment; however there still remains a hard core body who "roll their own" and exercise new techniques. You will quickly recognise these operators because in general, their video will stand out over the normal run-of-the-mill video.

The latest to come from the USA, namely from WOLMD, is direct conversion from fast scan to slow scan without any modification whatsoever to the camera. This complicated process will digitally convert any fast scan video to slow scan which opens up great possibilities.

Further to this, a slow scan to fast scan system is now working as designed by this same person. This is undoubtedly the slow scanner's dream. To do away with all long persistence phosphor tubes. You would then be able to view all received video on your common fast scan receiver. This process is not easy and requires a very large capacity memory which is loaded at slow scan rate and continuously read at fast scan rate. A project of this nature is almost impracticable for the Australian amateur due to the cost of the IC's needed. However, as the IC continues to fall in price, the practical feasibility draws nearer. Maybe by that time some enterprising person will have designed the complex PC boards.

Obviously the next possibility as a flow on is instant colour slow scan pictures. Technically, with what is available at this very time, it is quite feasible but the catch is how to do it without spending a million dollars.

Another interesting adjunct to the SSTV field is the SSTV video keyboard. As any slow scanner soon finds when trying to have a QSO, or especially in a contest, he ends up with large amounts of paper with call signs, reports, and the like he has been flashing before his camera.

This little magic box eliminates all this. It consists of a keyboard (like a typewriter) in which ASC II characters are generated and eventually converted to SSTV. Hence, you sit back and type away your QSO and video mix with your camera. No fuss, no bother, the hardest thing is the typing. This magic box with its 60 odd IC's will be available from the SSTV group as a PC board by the time you read this.

There is already a great queue of overseas amateurs awaiting its release.

COSTS

The first thing most amateurs ask is "how much will it cost me to get into SSTV?" The second statement is "Oh, it's too difficult for me".

Well, the difficulty angle as previously explained has been overcome by the production of first-class fibre glass solder dipped and gold flashed edge connector PC boards and it is simplicity plus to insert the components.

It is always difficult to put a price tag on a home-built piece of equipment for each amateur has his own degree of junk box. The basic components are hereby listed as a guide, but it must be remembered that nowadays prices change by the hour.

PC board for monitor (X51) \$11.00
PC board for camera (X52) \$11.00
11 inch E26 tube \$26.50 + \$1.00 P & P
SSTV sampler \$6.50
SSTV sync pulse generator \$6.50
K7OLO fast to slow scan boards (2 in set) \$20.00 pair
Resistors capacitors IC for monitor — supplied on request
Resistors capacitors IC for camera — supplied on request
Monitor and camera kits etc. available on request.

Finally, to answer some of the more general questions that are asked besides availability of circuits and costs which have been covered earlier.

Q. Where can I obtain information on SSTV?

A. SSTV handbook published by 73 available from advertisers in AR or SSTV Group.

Q. Where do you find SSTV operators?
A. Mostly on 14 MHz (14230 kHz) which is the most active frequency for all slow scan, but there is activity also on 3565, 7126, 21340 and 28650 kHz when conditions permit.

Q. How can I record SSTV pictures?

A. As SSTV signals are FM audio tones angling from 1200 Hz (Sync) to 2300 Hz (white) they can be recorded on a good quality tape recorder. In attempting to record signals blind, (without a monitor working) off air, your results will be doomed to failure. This is due to the cor-

rect tuning necessary (in true fact it is not that critical) and without a working monitor is difficult to achieve. SSTV dubbings of tapes for alignment purposes are available to you by sending your tape to the SSTV group. Remember direct electrical patching between recorder and receiver audio is a must, otherwise severe sync pulse distortion will result.

Finally, on tape recorders. Wow and Flutter are the major problems and even with the more expensive cassette types this proves objectionable. Straight lines etc. tend to jitter. Real to real recorders to 3 1/4" or preferably 7 1/2" per second are most satisfactory. However, if you will accept the jitter, use cassettes. Watch out for RFI into your recorder. A lot of cassette recorders with ICs suffer badly in this regard.

Q. How do I resolve information on SSTV?

A. Join in with the SSTV gang on 14230 kHz and someone will always be willing to slide off the frequency and give you the latest "drum". Everybody is most welcome, but rag-chewing without video on the International SSTV net frequencies should be avoided. SSTV operators in general are poor letter writers and it is quicker to get you acquainted with what concerns you over the air.

Q. I cannot handle anything with these IC things in them.

A. A complete untruth! They are simple to fault find and anyway, if you get into trouble, there are plenty of people to help you on 14230. Besides, if you follow the drawings and put the right things in the right place, you should have immediate success. The next SSTV operator has built the same monitor as yours.

Q. What test equipment is necessary?

A. (a) Ideally most SSTV stations should be equipped with a DC CRO that will reach to 5 MHz.

(b) Alignment of modulators require precise frequency adjustments which indicates a digital frequency meter; however, tone tapes are available for this purpose.

(c) Normal multimeter etc.

Q. What modifications to my transmitter are necessary to transmit SSTV?

A. Nil — by using, if you have it, the "phone patch" facilities (e.g. FTDX 400 etc.), the 600 ohms input/output can be fed to and from your SSTV monitor or modulator. Remember SSTV is FM audio and the ratings for PA are continuous duty cycle. Reduce your input accordingly or a PA tube "wipe out" will occur within no time at all. Watch for colour in PA tubes and reduce input below this point when transmitter is correctly tuned.

Typical Symptoms of picture degradation:
Multipath distortion. Picture displaced due to loss of sync or multiple sync. At times picture unreadable even though signals are very strong. Fault is due to propagation causing sync to arrive at different time intervals. Nothing can be done to overcome this trouble. The higher the frequency the less the multi-path effect. Long path signals are less affected than short path

of similar or even weaker signal strengths.
Picture too dark — receiver tuned too low in frequency. Often loss of sync will occur at the same time.

Picture too light, lacking in contrast — Receiver tuned too high in frequency. Loss of sync not always noticeable and in general vertical sync disappears before horizontal sync.

Snow on picture when signals are strong and sync is good — Too high a level feeding monitor.

One of the most common complaints confronting the SSTV scene revolves around received pictures having too much contrast or too little. In 90 per cent of these cases, the fault lies at the transmission end. It is an easy trap to set up the camera and monitor to give the indications of a perfectly balanced contrast range, however, this need not be so. Thus a "shack standard" must be maintained to overcome this problem. Commercial monitors normally supply a test tape for adjustment purposes. On this tape a grey scale is presented and the monitor should be set up to this standard, controls marked for reference and settings used as such to set up your camera. For those who roll their own, one can procure a test tape as mentioned earlier, or have someone send you grey scale over the air for calibration purposes. Ideally, one should construct a grey scale generator for this purpose. The X51 and E26 monitor combination can easily display six distinct levels of grey scale.

Hopefully, now your interest has been aroused in SSTV, for you can see the way has been paved in VK to help you join in this rewarding aspect of our hobby by allowing you to follow in the footsteps of others who have learned the hard way.

Join in the fun, we hope to see you on the nets.

ACTIVE SSTV OPERATORS IN VK, ZL AREAS

	Col	VK4NP	Nm
VK1AU	Col	VK4NO	Tom
VK2KK	Col	VK5BS	Barry
VK2KI	George	VK6PV	Peter
VK2AGD	George	VK5AV	John
VK2NMO	Mike	VK5CY	
VK3CR	Rod	VK5MF	Al
VK3TE	Stan	VK5WC	Chris
VK3LM	John	VK5ZPG	Peter
VK3KK	Rag	VK6CS	John
VK3WJ	Bill	VK7JV	Trevor
VK3PB	Jack	VK7FB	Mike
VK3EG	Ted	VK7TM	Tom
VK3MN	Milton	VK8KK	Don
VK3AGM	Phil	VK9XK	Tony
VK3ABM	Wally	P29DJ	Graham
VK3AOL	Geoff	ZL1ADW	Malcolm
VK3AMC	John	ZL1ADY	Ian
VK3BOB	Bob	ZL2AAV	Ralph
VK3BFM	John	ZL4PJ	Brook
VK3BAX	Mac		
VK3YEO	Mac		
VK4TM	Trevor		

SLOW SCAN NET FREQUENCIES

60	3670 kHz	15	21340 kHz
40	7136 kHz	10	28650 kHz
20	14230 kHz		

For information on SSTV, Kits, PC Boards, alignment tapes, picture tubes etc., contact John Wilson, VK3LM, c/- Eastern & Mountain District Radio Club, PO Box 87, Mitcham, Victoria.



Rig of Barry VK5BS showing home-built flying spot scanner and monitor.

Telecommand and Telemetry of the OSCAR 6 and 7 Communications Satellites - Part 2

David Hull, VK3ZDH
Project Australia

As had been stated the Australian system at AutoCommand was designed and built as a package. Non-availability of computer time on a day to day basis and the possession of certain items of hardware fixed the initial design more on economic grounds than anything else.

AUTOCOMMAND — 2. The Australian System It was decided from the start to eliminate as much as possible the use of electro-mechanical devices such as tape readers and magnetic tape recorders to ensure as much reliability and freedom from maintenance as possible. Previous experience had proved the practicability of static shift registers and character recognition as a cheap sequential memory source. Baudot code was chosen instead of the more usual ASCII simply because the author owned a Creed Model 7B

teletypewriter. The initial character recognition of the 31 characters (ignoring upper and lower case) of Baudot has proved more than sufficient for Oscar 6. However, Oscar 7 will require the use of 35 command words alone so upper and lower case memory circuits will be added to allow expansion.

The choice of memory length in terms of bits was taken as a result of the unique window of the 10s satellites (and hence Oscars 6 and 7 which were flown as secondary payloads with these satellites) over Australia. The 10s orbit pattern results in 2 groups of visible orbits over Eastern Australia in a 24 hour period, 3 to 4 orbits centred on 0600 hours east and a second group centred on 2200 hours east. A period of some 8 hours exists in the middle of the day when no orbits are visible. This pattern of command requirements led to the choice of 2 independently loaded shift register memories for a 24 hour period.

It was decided early to only pre-programme 24 hours in advance to allow maximum flexibility for last minute changes and a safety measure in case of power failure, etc. It has been found in the many months of operation of this system that the author is in attendance to check approximately 80 per cent of the orbits commanded. A further benefit of the choice of 2 memories to cover 24 hours has been the ability to use a simple elapsed time clock between orbits. The "wait" period has been fixed at 100 min, and this is derived by counting 50 Hz mains cycles.

With Oscar 6's orbit period of 114.94 minutes the 100 minute wait period allows commands to be sent over at least the initial 50 per cent of the 24 hours. Letters (or symbols) from the shift registers are read in groups of 2 or 3, depending on whether antenna positioning is required, at intervals of 1 minute during the orbit. A "minute" word therefore is of 16 or 24 bit length (2 bits are used as the letter stop function instead of the usual one, to allow even subdivision of the 512 1024 bit shift registers used). The two letter "word" is used for the more critical control functions such as "transmitter on" or "off" as a safety measure. Single letters within the 16 or 24 bit minute word are used for command selection and antenna positioning and for time wait periods.

It is intended to allow a more versatile wait period by using a programmable divider as part of the wait clock with its programming code selected as the 2nd letter of the wait command. This will be added when time allows. As the attached mnemonic list shows certain control functions such as memory load, memory read and memory selection (4 separate shift registers of varying multiples of 512 bits are available) can only be selected when the shift register clock source is disabled (stop mode). All control functions are sent from the teletype keyboard in the stop mode. This allows positive checking of S.R. load as a teletype print out. Correct timing is assured by parity check circuits, also the S.R. are always fixed to capacity. The recognition of 4 successive 'N' will disable the S.R. clock and place the system back in the load stop mode, i.e. under the command of the keyboard. Figure 1 is an example of a "minimum" load of 512 bits covering 3 orbits and the intervening wait periods.

Antenna positioning is not used in this example. I.e. an omni directional antenna is used. This is adequate for orbits 15° max. elevation or more. Directional antennas on azimuth-elevation mounts must be used on lower elevation orbits or where weather conditions (hot days) may cause bending of the command signal. When antenna positioning is not required a 18 bit (2 letter) word is selected and the appropriate antenna controls switched off. When antenna positioning is required a 24 bit word is used and the first and second letters within the 24 bit minute word frame are used to stop the azimuth and elevation units (in 10° increments) when required. Autohoming circuits are used on these control units after each orbit. The azimuth unit used is a modified commercial Stöbe rotor and the elevation unit was made for the author from a DC motor with worm gear drive and remote lead sensing by a friend. The last letter of the 16 or 24 bit word is used to select the command to be sent and through a latch and matrix selects the 3 bit of 7 code to be sent on the command encoder board. This command is sent in brackets of 5 at 1 second intervals at each minute period. The drive to the transmitter is removed between these bursts of commands so that a minimum of radiated signal is used.

As the block diagram shows, the transmitter final power amplifier, a 4G x 250R vacuum tube, which is in a class C protective bias situation, has plate and screen heater, and bias voltage applied for the whole of the pass. 1 minute before the signal is due recognition of the word TR applies power to the heater and bias circuits of the tube and to its blower; 40 seconds after this a time delay relay applies plate and screen power. 20 seconds after this, at the next 1 minute word, the first command is sent when the RF exciter and driver, which are all solid state, are energized. Sufficient drive is used to overcome the bias. Recognition of the characters CrVf turns off power to all stages and the next word sets the wait period until the next orbit.

Positive checking is maintained on the system by a series of LED indicators including a 7 segment

MINIMUM LOAD 3 ORBITS 512 BITS

```
TR X X C V V
WTR X X X B B V V V C C
WTR X X R C V X
NNNN
```

Words are 2 letters (16 bits) long.

MINIMUM LIST, Australian Auto Command

Load stop functions only

Memory Select
(8 Deselects Previous Mem)

LOAD
READ

LOAD or READ FUNCTIONS

WAIT

Transmitter ON

Antenna Move (NOT USED)
(16 bit word)

COMMAND

1

2

4

8

17

TRANSMITTER OFF

Print (Teletypewriter)

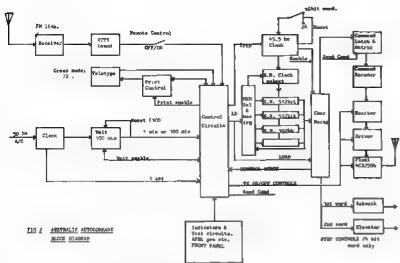
Stop Printing

Stop (Reverts to load stop)

	1st let	2nd let
Memory Select	0	7
(8 Deselects Previous Mem)	0	8
	0	9
LOAD	L	D
READ	R	D
WAIT	W	To be followed by wait period (Hexadecimal x 10)
Transmitter ON	T	R
Antenna Move (NOT USED) (16 bit word)	M	This is 1st letter of 3 letter group.
COMMAND	Z	(TRANSPONDER ON)
1	X	(TRANSPONDER OFF) THESE ARE THE
2	C	(43.1 mhz Beacon off) MAIN COMMANDS
4	V	(Telemetry to 10 WPM) USED.
8	B	(ACC ENABLER)
17	A	(Clock Reset)
TRANSMITTER OFF	CR	LP
Print (Teletypewriter)	P	R
Stop Printing	P	S
Stop (Reverts to load stop)	N	N N N

Figure 6 Sample Frame of Teletype Telemetry Data

```
11001-10111-00000-00101-11101-01010-11111-10101-00111-11011
11001-10111-00000-00101-11101-01010-11111-10101-00111-11011
00977-01558-02873-03730-04157-05534-06368-07198-08614-09734
10854-11220-12348-13149-14000-15674-16075-17598-18664-19025
20238-21363-22532-23123-24672-25389-26131-27506-28907-29211
30871-31089-32140-33585-34613-35831-36722-37255-38234-39189
40645-41452-42950-43001-44335-45786-46479-47362-48919-49604
50057-51482-52942-53717-54451-55184-56999-57500-58236-59968
```



numeric led indicator which indicates the SR in use and a 3 figure (7 segment leds again) bit counter on the system clock. A further 3 figure counter on the wall clock is being installed.

Several peripheral circuits have been added to allow control of the teleprinter to save paper when printout is not required. Because the system uses the Amateur standard 45.5 Hz Baudot code speed

provision has been made to allow remote control of the system and memory loading through an RTTY link on command frequency via an AFSK demodulator built into the unit. This allows precise starting of the clock and hence the whole memory system from a remote source if need be. Other subsystems allow continuous clock operation to check memory loads and provision for dema-

ing the loads into a cassette recorder via a phase coherent AFSK generator also built into the hard-

The hardware involved is mounted on a total of 15 small plug-in boards to allow easy modification of servicing. TTL, small and medium scale integration to use wherever economically feasible.

The SR and some other minor items are National Semiconductor Mos. The matrix at present is used to select the 3 or 7 code is to be replaced by a PROM to eliminate the huge matrix required for 35 separate commands. The total number of IC involved is approximately 120 and all the NON RF hardware and power supplies are contained within a 7" depth sliding 19" rack tray.

A system of standard orbits in 5° increments of equator crossovers is used to predict AZ and EL settings for each orbit. These are generated by a small Fortran programme which allows prediction of the position of the satellite in terms of latitude and longitude co-ordinates. A further programme is supplied to each command station that predicts orbits in terms of minute by minute corrections to AZ and EL. As will be seen by the above, the system is very simple and does not require much and nothing else. It depends entirely on the correct programme being fed in as 'software' and also on the programme being started at the correct time. A more long term and sophisticated alternative is being developed which will require one of the new single IC 8 bit parallel processors now available. It is planned with the unit to build virtually a dedicated minicomputer so that the standard orbit programme can be stored and a long term reference to the orbit data can be implemented by automatic reference to them and a suitable time reference. It is also hoped to supply these units to the other command stations, nominally by AMBAT wider aise, as a 'standard' system.

(To be completed)

The "Pasatest" Communicating Calculator

There are so many calculators and minicomputers on the market nowadays that to merit the claim that it is the ultimate in its field, the Peaselet Communicating Calculator must be — as indeed it is — a fantastic piece of electronics.

In appearance it is exactly like the average medium priced pocket calculator, but internally the Pasatest is completely different. It is, if one can coin a phrase, actually a digital handle talkie designed to enable its fortunate owner to pass any examination for which he wishes to sit.

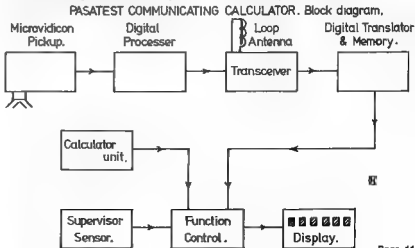
The head of the unit can be seen from the block diagram, is a micro teletype transceiver with the difference that instead of a spacer printout the characters appear on the twenty digit alphanumeric display. When he receives the examination paper the owner places the calculator on it, presses a key marked FIX, and casually moves the instrument over the paper. A microvidicon scans the writing and feeds the information into the digital processor and it is then transmitted to a friend with a similar instrument in a parked car near the building. The friend writes out the answer and transmits it to the examinee who copies it down as it appears on the alphanumeric display. So that he can copy at his own pace, each group of words is displayed until the PRO. (proceed) button is pressed, when the next group appears.

SUPERVISOR DETECTOR which, if a supervisor comes within three metres of the examinee, automatically converts the instrument into an ordinary calculator. When the danger has passed the examinee presses the PRO. (proceed) button and carries on copying down the answer. It will now be clear why the manufacturers, A. S. Windell Ltd., of Triton on the south coast of Tasmania, do not put their own name on the calculator but market a variety of models exactly resembling various internationally known makes of pocket

Roy Hartkopf, VK3AOH
34 Toolangi Road, Alphington, 3078

calculator. All models are at present in extremely short supply but if anyone wishes to send cash or postal notes to the value of \$73,000.00 (seventy three thousand dollars) to the writer as a deposit he will endeavour to procure a pair as soon as possible.

NOTE 1.—If desired the PASATEST COMMUNICATING CALCULATOR can be directly interfaced to a computer, eliminating any human error. An alternative readout in the form of an automated biro is also under development. ●



The Wagga Floods — and the Amateur Radio Communications Network September 1974

Members of the Wagga District Radio Club recently proved that once again Amateur radio communication capability is an essential part of this country's Civil Defence, and emergency scheme.

The Murrumbidgee River proved how vicious it could be during late August and early September. Twice it rose to serious flood levels. On Thursday 29th August the mammoth task of evacuating almost the entire population of North Wagga was commenced, for it was envisaged that a severe flood would hit the city within 24 hours. The calculated height was to be in the 31 to 32 feet range. At this height North Wagga would certainly be covered with at least 3 to 4 feet of water. However, due to continued heavy discharge from Burrinjuck Dam plus continued increases in local rainfall, it was realised by the authorities early on Friday the 30th that the river would reach an all-time high of over 35 feet. (The highest reading for over 100 years). The peak was reached late Friday night at 35 feet 3 inches.

In so far as the Wagga District Radio Club was concerned, they were initially requested by Civil Defence to be on stand-by as a back-up for the existing SSB and 27 MHz equipment. As early as Thursday it was obvious that the Civil Defence Systems would not be satisfactory for the "short haul" work that was to be done. Long skip on 3730 kHz, many on-frequency heterodynes, plenty of ZLs, plus great quantities of general transient noise interference, was making the passing of even simple routine messages a very time-consuming affair. Coupled to this was the continuously increasing need for fast "evacuation-type" messages from North Wagga back to Civil Defence Headquarters on the city side of the river.

At approximately 10 p.m. on Thursday, the Wagga and District Radio Club VHF Net was officially called in to replace Civil Defence SSB on the major traffic handling nets. Continuous traffic was then passed (via WDRS VHF) between the Wards Post evacuation centre and Headquarters. Whilst our Amateur message handling was far removed from the official Civil Defence procedure, we would mention that at the peak of traffic important messages were being handled, without any known errors, at a rate of at least two a minute. The noise-free signals that were being exchanged between our operators via VHF over such a relatively short distance when compared with the noises and problems present with the HF SSB did

impress many influential people on the scene. When it was realised that the river was to reach in excess of 35 feet, Civil Defence ordered all personnel out of North Wagga (including our team, minus their vehicle which was abandoned).

The major scene of activity then switched to the main city side of the river. For those readers who have never visited Wagga we would mention that many miles of major levee banks surround the entire northern side of our city, with minor banks protecting the eastern and western sectors. With the prospects of at least a 35 foot river, and with the major levee bank designed many years ago to stand against a 36 foot river, a very serious situation had developed. A concentrated effort was made by every available service facility in Wagga to generally reinforce and increase in height all levee banks. As the river rose, the main duty of WDRS VHF operators was to now work with Civil Defence levee patrols and to report problems and requirements as they appeared. At one time during the Friday night there were five VHF mobiles on patrols with reports going directly to Local Headquarters of Civil Defence.

To go into details of the various situations and experiences encountered during the operation would take pages to relate. Suffice to say that the WDRS supplied continuous communication between base and out-stations from around 10 p.m. on Thursday till around 11 a.m. on the Saturday. By this time the Murrumbidgee was past its peak at Wagga and was very slowly falling. An electricity authority team took over from the WDRS on routine levee patrols and our members took a well earned rest on stand-by.

Because of the high average rainfall in our area this year, it was found that the surrounding flooded country-side was very slow in "running off", and as late as Wednesday many adjacent areas to the river were still covered by feet of still water.

On Thursday 5th September, with the river still in this swollen state, word was received that a second flood could be expected by the weekend. Expected height would be in the region of 31 feet.

Once again the WDRS was called in to provide all local Civil Defence communications. Two VHF bases were set up (Local Headquarters and North Wagga School), plus two river reading posts approximately 6 and 12 miles up stream. In addition to these "fixed" stations, levee bank patrols in North Wagga were to be covered by VHF. The whole relief operation this time was centred on the saving of North Wagga

Harry Hendriks, VK2ZHX
Wagga District Radio Club,
P.O. Box 25, Wagga Wagga, 2650

homes from being inundated with water for the second time in just over one week. The operation was successful due to the efforts of many volunteers from all sections of the community. This second flood resulted in our operators being again on duty continuously from 9 a.m. on Friday 4th till 9 a.m. on Sunday 6th September, when the river had peaked and was slowly falling.

At the time of writing, the areas surrounding the Murrumbidgee from Gundagai to Narrandera are mostly covered with various depths of still, muddy water. We all hope that we have seen the last of floods for many years, but with an unusually high snow build-up in the catchment area waiting to thaw, plus the rather ominous looking weather maps, we are feeling a little uneasy at the moment.

OVERSEAS PUBLICATIONS SUBSCRIPTIONS

- Inflation and new exchange rates. "Rapid Inflation", says the editorial in QST for Sept. '74, "the past couple of years has had a severe impact on ARRL's budget".
- The following are the latest 1975 subscription rates which supersede all previous advices (including that on p.25 of October AR) —

	1 year	2 years	3 years
SA Ham Radio	6.25	10.50	15.00
CO*	6.50	11.00	14.50
QST	8.50	17.00	25.50
Break-in*	4.20	—	—
73	7.00	—	13.50

Includes Communication VHF

Communications*	4.00 — Surface
	6.20 — Air Mail
CO-TV	2.35 — —

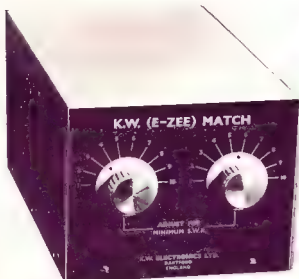
*Present rates.
†Please ask for membership form

- Write for these and details of other items to.

MAGPUBS

P.O. BOX 150
TOORAK, VIC. 3142

- Remember these as splendid Christmas presents



KW E-ZEE MATCH, an efficient coupling unit of the Z match type for use from 80 to 10 metres over a wide impedance range. For use with balanced or coaxial feed lines at up to 1KW PEP.



KW-107 SUPERMATCH, an all in one unit, combines an E-ZEE match, Antenna switch Dummy Load and SWR/PWR meter for balanced or coaxial feeds. Wide Impedance matching range at up to 1KW PEP.

ALSO AVAILABLE:

KW-160, an L" network coupler especially for 160M, can also be used right through 80 & 40 for single wire or co-ax feed. Similar size and appearance to the E-ZEE.

KW-109, Higher power version of the KW-107, same size but employing higher voltage condensers and heavier coils.

KW MULTIBAND antenna traps. Comprises two special trap coils, ceramic centre "T" insulator and instructions for a 108 ft. 80-10M dipole, using co-ax or twin 70 ohm feeder.

KW BALUN, ferrite 1:1 suitable for 50 or 70 ohms, lightweight and waterproof, has screw terminal connection.

KW-103 SWR/power meter, toroidal pick-up type for accuracy and reliability, 0-30 MHz. A quality unit.

KW DUMMY Load, air cooled, up to 1 KW, 0-70 MHz, 52 and 75 ohm.

KW ANTENNA Switch, 3 position co-ax switch with UHF type teflon connectors, usable up to 500 MHz, 1 KW PEP, cross-talk better than -80db.

KW-108 MONITORSCOPE, connects in antenna line for visual monitoring your transmission. Includes built-in two tone oscillator.

KW-2000E 160-10 M SSB transceiver, pair 6146 B P.A., superb construction, with matching A.C. P.S. and speaker unit.

KW-1000 80-10 M linear amplifier, uses pair of 572/T180L triodes in grounded grid circuit. Fan cooled, double screened P.A. Panel meter reads current, voltage and SWR.

Also available Barlow-Wadley XCR-30 receiver, AM/FM digital clock radios; A comprehensive range of Hy-Gain, Newtronics, Cushcraft and Asahi antennas, SWR meters; Rotators; Morse Keys; Digital clocks, etc.; Plus, of course, the full range of Yaesu Musen transceivers, transmitters and receivers.

The items on this page are but a few from our large and still growing range of accessories. If the accessory you require is not shown on this page then call us or our agents, we're sure to have it.

baill

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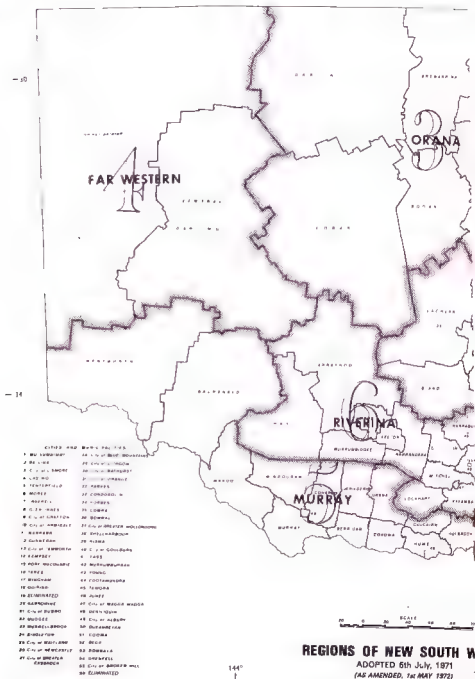
D.L.D. MITCHELL RADIO CO., 50 Ardara Road, Ashburton, Vic.
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VK2 WICEN and Broadcast zones

144°





What are we doing to ourselves

Peter B. Dodd, VK3CIF
1308 Glenhumpy Road, Glenhumpy, 3163

In between the sweeping generalities in this article, there is a great amount of truth viewed against our 'popular' identity, the performance at ITU conferences of many delegates from African and other countries and the dark clouds of a world frequency conference hanging over us for 1979. Perhaps the Eastern bloc countries are quite right in classifying amateur radio as a sporting activity. (Ed.)

Quite frankly, I am heartily sick and tired of all the preaching going on within the amateur service to justify to ourselves that amateur radio is a good thing. But more, later.

Do you hear footy requiring justification for its existence? Or table tennis? Or chess? Or stamp collecting? Or flying model aircraft? There is public acceptance of these activities as essential parts of everyday existence.

"And what are your interests, Joe?" "Reading, football and going to the beach in summer". "Very good Joe — what else occupies your time apart from work and sleep, don't you bet for instance?" "Oh, yes, I have a dollar a week on Tatts and follow the dogs a bit whilst having a drink with my mates down at the pub".

You see my point? First rate things like reading, watching footy and such like. Then down to the fringe-area things like betting and a drink or two.

Listening to the radio or watching the monster are other socially acceptable activities.

But mention amateur radio and what is the response?

Either it is an unknown activity or you are asked in a derogatory way about being 'one of those hams'. Kindly folk ask what is a ham and what does he do? Perhaps the word 'ham' did us more harm in the public relations field than everything else put together including interference to favourite programmes.

Have you never faced a supercilious enquiry about being 'one of those hams'.

"Oh yes", you say, "and I gave him a really expert run down on amateur radio which he won't forget in a hurry". "Did you — good on yer mate". Like to take a bet on his reaction to your good intentioned preaching? Did you hear him later in the week talking to his friends about meeting some ham bloke — "must have been a real nut-case the way he shoved the stuff down my throat".

In the public's mind is amateur radio an activity rated below the fringe area even?

If it is — why?

I'll tell you.

We have fallen down badly with our public relations work. Not merely lately but most of the time. Are we so wrapped in our hobby, so self-centred or so introverted that we have not time to publicise ourselves. What are we? A mob of rabbits for ever burrowing underground instead of shouting our excellence from the roof tops? We claim to talk to the world

but where do we hide publicity to the ordinary man in the street?

What does the public know — or care — about the OSCAR programme? Did officialdom see to it that amateurs received no mention for their part in the recent Queensland floods? What could a good journalist have done with amateur communications for Las Balesas and countless other out of the ordinary occurrences?

Things that are happening now! Not the stale old stuff about pioneering 200 metres and below. Or the vital part played long ago by amateurs in communications by wireless. All this is good stuff but forget it once it is in written history.

OSCAR satellites, moonbounce and other scientific experiments, day to day communications going on with an interesting background. These and numerous variations on such themes could regularly appear in the press, be heard on radio and be seen on television. But for sure, ban that word 'ham'. It has lost any value it once had. It is no longer funny — just as Tony Hancock's "It's raining in Tokyo" is dated. Incidentally, the use of 'that word' is to be discouraged on no less an authority than through a policy of the WIA Federal Council.

What are we doing for the young? What are we doing for beginners? What will we be doing for Novices? Are we so smug and so elite, so privileged, so know-it-all that we have no patience with anyone aspiring to climb the ladder below us?

What are we missing in the schools? It might be too much to expect amateur radio to be an examination subject but apart from a few dedicated individuals manning the occasional YRCS activity or a 'big deal' once a year appearance by a few people on JOTA what are we doing for the young?

Hit and miss methods hopefully believing that an occasional teacher in equally few schools will fire up enough enthusiasm even to inform students about amateur radio are no longer good enough. Every school ought to know something about Oscar satellites and how easy it is to climb on this bandwagon of exciting experimentation to broaden the pupils' knowledge of the world around him (and her, too).

No, we go around hiding our talents. Because we are 'amateurs'? Is the word 'amateur' as great a millstone round our necks as the word 'ham'? Everyone must have heard the expression 'he came up from the world of amateurs'.

I submit we must do a big job on our public relations, our beneficial effects and our potential value to the community. And

this applies to you, and you and you over there as well as to WIA activated publicity constantly flooding the media until they sit up and take notice of us.

All this is very different from sitting supine in your operating chair hoping the other bloke will do something; reading in our amateur magazines about the benefits of amateur radio and how can we stave off disaster by convincing ourselves we are, after all, splendid blokes full of knowledge and world-wide bonhomie; what the great 'we' have done and hope to do.

Amateur radio is not a secret society. The activity is not allied to black magic, witchcraft or any other little known lad or occult art. Sure, we have some mystic language but this is necessary fun, part of the game. We talk openly, even with Russians, but we are not communist spies as an article in the "Sun" of 18th March seemed to imply from a British Defence Council Report.

This article is intended to stir every right-thinking amateur into doing something about our public image. Not only now, not only next week, not only next year BUT ALL THE TIME, mate. Despite our increasing numbers we do not get more frequencies. Without frequencies on which to operate where would we be? Back to growing roses perhaps! ●

QSP

EMERGENCY COMMUNICATIONS

"It is expected that AMSAT-OSCAR 7 will be used in support of such (emergencies) communications during any such emergencies, as a back-up for HF radio, which is highly dependent upon favourable ionospheric conditions". Amst Newsletter, Sept. '74.

heading north in 75?

Why not time your visit to coincide with the second bi-ennial North Queensland Convention to be held by the Townsville Amateur Radio Club?

Place:

TOWNSVILLE — City in the Sun

Time:

28/27 JULY, 1975

Essential Equipment:

- (1) Mobile HF gear to join in the TARC nets while travelling to Townsville.
- (2) Mobile VHF gear for use in the city.
- (3) Homebrew items for entry in the competition (YL/XYL section also, not necessarily electronic.)

Registration details in 'AR' early 75.

What to do with that old receiver

By Harry Roach

Reprint from Zero Beat, April 1970

That old radio that Uncle Bob gave you, what can you do with it? Ever thought of making a Signal Tracer out of it? This is how you do it. If it is a superhet type, you can make it do at least 5 things.

1. A signal generator.
2. An RF probe tracer.
3. Detector output of set is used to apply to any amplifier.
4. Use the set's audio output for testing other gear or as a PU amp or can be used with hi-level output microphone.
5. Lo-level output.

You will need a switch with 5 positions. 2 x 100pf mica condensers. 3 x .05 condensers (Phillips polyester) value not critical. Use at least 400v working type. Quantity of coax. (75 ohm or microphone cable) PMG jack and plug and a home made probe (out of a ball point pen shaft).

By connecting a 100pf condenser to the oscillator section of the tuning gang, you pick up the RF generated by the local oscillator of the set. This should be good until at least the third harmonic (see table)

and if you use a list of broadcast stations you can work out what generated frequency you are on or what harmonic. This is very handy as a rough check on your short wave receiver, or for lining up.

Make a probe out of a ball point shaft. Plug one end with some insulating material and insert a knitting needle or a bodkin. Solder your coax. to this and the other end of the coax. goes to a PMG jack plug.

Don't forget to earth the shielding. When the S/W is in the No. 2 position you can use this probe to pick up RF signals on another receiver. If you have trouble in the RF section of a set, use the probe by tracing a signal until you get nothing and then you start looking at that particular section for trouble.

The aerial is disconnected from the tracer whilst tests are being made with the exception of the No. 3 position.

Dial	Occ.	2nd	3rd
Tuning	Tuning	H'monic	H'monic
550 KC	1005 KC	2010 KC	3015 KC
3AR (620)	1076 "	2150 "	3225 "
3LO (770)	1225 "	2450 "	3575 "
3AW (1280)	1735 "	3470 "	5205 "
3AK (1500)	1855 "	3910 "	5865 "

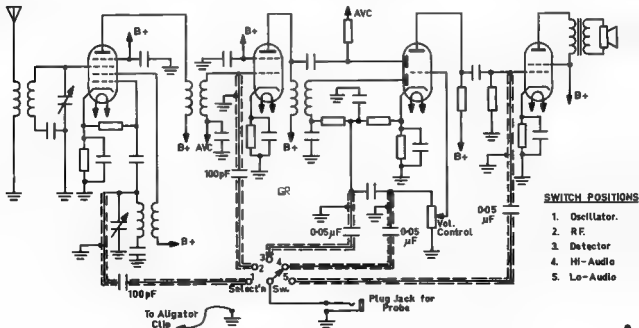
(with set using 455 KC I/Fs)

I realise that there will be many types of superhet about and the types of valves will vary enormously, but the principal is the same throughout. In this diagram the first valve is the Mixer, the second is the IF amp, the third is AVC DET. and 1st Audio, and the last valve is the Output amplifier. The rectifier is not shown.

When making connections to the switch place the condenser as near as you can to the component or element and the length of shielded cable is then earthed near that point and the rest of the cable run to and joined at the switch. A length of about two feet joined to a crocodile clip makes up the earth lead and this can be soldered or just plugged into the chassis.

If you like this idea and give it a go and find it successful you can later on make a more sophisticated tracer by using most of the equipment again but altering some of the coils and switches. Try this first. The main thing in getting this going, is to get a copy of the circuit of the receiver (if you can) or get some friend to help out with where to put the connections on. It looks a bit hard, but it really isn't.

BELOW: A standard circuit for pre-solid state broadcast receivers.



Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmilton Rd., Boronia, Vic. 3155

This month I have a few more short circuits from Zero Best.

JUNE 1969 HARRY SMITH VK3ZXB. An ordinary, cheap, glass cutter (disc roller type) makes an excellent tool for cutting aluminium sheet. Some care must be taken to score both sides opposite each other then flex until it breaks at the score. In most cases, and especially if the sheet is large, it pays to clamp the aluminium between two pieces of timber of appropriate size. Try putting one end in the vice and fix the other with a G clamp, or use two clamps.

JUNE 1969. Correcting fluid designed to cover mistakes in typed mimeographed stencils can also be used for repair of small tears and holes in speaker cones. The solution is inexpensive and can be purchased in small bottles from any of the office supply stores.

AUGUST 1969. Winding coils with enamelled wire and having trouble cleaning the ends for soldering? Then try this. Heat the area you want to strip in a methylated spirit flame. A small jar with screw lid with a wick through a tight hole in the top will do as a burner. When it is red hot dip it into some cold methylated spirit and you have a perfectly cleaned wire.

AUGUST 1969. After applying decals (transfers) to a panel, cabinet, etc., fix them to ensure their permanency. Use a small camel hair brush to apply a small amount of acetone fingernail polish remover, or lacquer thinner to the decal. Use just enough solvent to dissolve the clear decal backing.

APRIL 1970. Where there is not much room to work, replacement transistors will be easier to insert if the leads are staggered, that is cut each lead a little shorter than the other. This allows you to insert only one lead at a time instead of trying to manoeuvre three leads through three holes all at once. The excess length can be cut off after the leads have been soldered.

APRIL 1970. One neat and simple method of providing taps on hand wound coils is to make a loop in the wire and twist it two or three times. Continue on with the coil to the end and cut the loop on one side near the twist, clean the twist and solder. The piece of wire in the loop gives you your tapped lead.

Q&P

RE MARKING STATIONS

Radio telephony weather broadcasts radiates from the Sydney area on 3432, 6860 and 18017 kHz at each hour and 30 minutes past each hour. The broadcasts on 3432 and 6860 are good markers to determine whether 30 m and 40 m bands are open from your QTH to VK2, especially the Sydney area.

Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers

The Editor,

Dear Sir,

Brian Harman's letter in September issue has spurred me to write about the problems of the associate member in the WIA. I cannot but agree that associate members do receive a raw deal — at least in Victoria. Some three to four years ago a delegation from the Eastern Zone at a special Divisional Council meeting brought up this very point, and the additional point that associates have no voting rights even in matters which affect them only.

The membership fee which now stands at 95 per cent of full membership fee is unjust considering the reduced privileges the associate receives. They have no voting rights on any subjects, their WIA listers numbers are not published, there are few articles in AR with any value to them, I'm not sure but I think they pay to the IARU, they pay for part of the Federal conventions at which their affairs are not discussed, and they have no need of the help of the TVI committee or to receive assistance in dealing with "problem" neighbours. The association with these things in mind that the Eastern Zone broached this subject. The Eastern Zone was told that it cost just as much to administer an associate as a full member and that there could be no consideration of associates having any voting rights even on subjects that only concern them. The inference was more for the associates for belonging to the WIA. Regrettably, I have no reason to believe that the Victorian Divisional Council have changed their minds on the importance of the associate in the whole scheme of amateur radio.

I believe that a membership fee of 70 per cent or thereabouts would be reasonable for an associate to pay, for what they should get out of the WIA and for what they should put into the WIA. It cannot be just a one way affair. For example, on investigation it appears that the listers numbers were dropped from the callbook because they were inaccurate either through the WIA records of this nature assuming a low priority, or the associates did not advise the WIA of changes of address and such like. Why don't the people who are interested in this listing get together and make sure that the listings are accurate and up to date. Perhaps an approach could be made to the Editor of AR to determine whether each Division could submit an insert for each State of the listers numbers, names and addresses in much the same way as the callbook amendments are done. The system I envisage would be that VK5 would only receive the VK5 list of listers, likewise VK3 only the VK3 listers and so on.

I couldn't agree more that the content of AR directed towards associate members is relatively small. However, I believe that it is shared at the associate and the newly licensed amateur. Regrettably very little feedback is received to determine whether or not this column is filling this need. I have appeared from time to time to help with the column and have been desisted by the silence of people speaking up and offering. I have very little time to prepare articles — a co-author for this segment of the magazine would be most desirable. I cannot recall when I last saw an article written by an associate. It is difficult for a licensed amateur to write for people with significantly different interests. The associate member should contribute more to the magazine, not just bemoan the fact that there is very little to interest him in AR. The SWL notes died a natural death through lack of contributions by the associate members.

Perhaps the whole outlook of the WIA executive, divisional council, rank and file members and the associate members should change concerning what role the associate plays in the WIA. The associate grading should be the way in which a radio enthusiast is introduced to amateur radio. I believe that the person we are aiming to attract to the broad spectrum of amateur radio is the holder of it — because of lack of publicity on our part. These people of whom we know nothing would join as associates and a large proportion would

likely become amateurs. We need good publicity followed up by good educational courses in amateur radio. These two aspects will be most important when and if the Novice certificate comes in. Quite a proportion of the 27 MHz pirates might not have been pirates if we had had some publicity in the World at large, and courses of instruction to help them on the way to amateur radio. I estimate that there are more pirates than licensed amateurs. Wouldn't it be good if most had become amateurs instead of pirates? Have we lost these people because of our "closed house" attitudes, I say in many cases we have.

To recapitulate: (1) The associate member has my support for a lowering of fees in his case, and I am sure other full members would too. In each case contact sympathetic amateurs in your own states so that this point can be put forward. If you don't contact full members you cannot expect their help.

(2) I believe that associates should have voting rights but only on those things which directly concern them.

(3) Associates themselves need to push for the re-education of the listers numbers.

(4) Associates need to contribute more to AR. If they want a fair coverage of items of interest to them.

(5) The WIA in total needs to look carefully into the role of the associate as it is and what it should be.

(6) The WIA needs to publicize amateur radio much more widely than it does currently, and perhaps steer young people who might go pirating on the road to amateur radio.

(7) The WIA needs more and better instructional courses for radio/electronics enthusiasts. Perhaps some of these courses could be based on these types of courses should be subsidised under the free tertiary education scheme.

(8) These particular points become increasingly important with the possibility of Novice licensing. Think these points over whether you be a full or associate member. The time for change is perhaps already upon us.

Rodney Champness, VK3UG

The Editor,

Dear Sir,

I was intrigued with the problem raised in the letter to the Editor of AR, July 1974, by VK8TU, and have given a few thoughts to it.

I have not seen the reference quoted from the "Radio Communication Handbook", hence I do not know as to what type of valve or circuit conditions to which it applies.

The statement is correct in relation to a type 813 beam power valve used under class C conditions with a very stable independent screen grid power supply. This was verified in a practical test with an 813. When tuning the plate circuit through resonance, the plate current dip and the screen grid current peak occurred together.

The reference that in the 813s no grid current was flowing, indicates that the 813s were being used in either class A or class AB1, and probably with anode to cathode feedback. My reference to the type of drive being used was made, i.e. grid or cathode drive.

The 813s is a little different in one respect from other beam power valves. It has a rather low screen grid impedance and it is this which makes screen grid modulation slightly more difficult than with, say, an 807, for AM.

I have extracted the following data for a pair of 813s from a valve manufacturer's data sheet for class AB1 operation under ICAS conditions. Plate Voltage 750 V.

Screen Voltage 500 V. Preferably obtained from a very stable power supply, either independent or extra well regulated.

Control Grid Voltage 50 V. Again preferably from a well regulated supply. Cathode bias is not recommended.

Plate current. Zero signal input. 57 mA, maximum signal input 227 mA.

Screen grid current. Zero signal input. 7 mA, maximum signal input 27.5 mA.

Power Output 120 watts.

Assuming that the 813s behave as stated in the Handbook, the problem may be due to any of the following:

Screen grid voltage not sufficiently stable. This is vitally important as variations in screen grid voltage have more effect on plate current than

variations of plate voltage. (More so than in a tube.)

Screen and current supply from power supply insufficient, i.e. the power supply voltage may be reasonably stable even if the power supply cannot provide sufficient current.

Control grid bias not sufficiently stable.

Use of cathode bias. (Cathode drive systems can introduce unsuppressed cathode bias because of the ohmic nature of the drive circuit.)

Control grid resistance is excessive. If used, suggest a change to RF choke.

Use of parallel valves, it may happen that unity power factor does not occur at resonance. Qu is common with parallel triodes.

Output loading not tight enough.

Trust that these notes may help in solving the problem

Chris Cullen, VK3XU

The Editor,
Dear Sir,

I noted with interest the listing of top scores for the 1973 QO WW WPX Contest (#20 AR, August 1974).

It may be of some interest to you that I was successful in obtaining "second world high" in that contest as single operator on 21 MHz with a score of 343, 826 points operating as VK3RY (PBRU Government).

Perhaps of equal interest (and I trust encouragement) to would-be contest participants is the fact I throughout the contest my final PEP to the antenna never exceeded 500 watts. The antenna is a "home brew" 8 element monoband Yagi with a 34 ft boom and (believe it or not) for the past five years has been slatted unerringly by a Sloffe Rotator!

The same combination was used on 21 MHz for the 1973 VK-ZL Contest.

Ron Johns
PBRU/AR VK3RY/AR VK3RJ

MWIA and foundation member of Radio Society of Papua

The Editor,
Dear Sir,

I would like to say that I am in agreement with Brian J. Hannan's letter which was published in AR for September 1974.

I cannot see why Associate members should pay \$17.50 a year to join the WIA which, as Mr. Hannan stated is only 50c less than a full member. The associate member (as far as I can see) does not have a say as to how the money the WIA gets is spent, and is unable to vote on any matters that will affect him when he obtains his Amateur licence. Neither can he get a concession on a ham band or general coverage receiver as do full members if they import a transceiver into the country.

There must be several associate members that are more interested in the listening side of amateur radio. That is, sending reports to amateurs and receiving QSL cards, and through no fault of their own are not able to become an Amateur.

There must also be a number of associate members apart from those sending QSL cards to amateurs, who enjoy reading AR, and have to join the WIA to obtain it, as it is not available through book shops or newsagents.

The only advantage I can see that associate members get from the WIA is the non-postage on QSL cards. I am not running the WIA down, as they do a good job for the fully licensed Amateur.

The same thing happens in NZ where the associate member pays 50c less than the "transmitting" member. Although both have to pay per card to be sent through the NZART Bureau, they also have no voting rights similar to the associate member in Australia.

73 Barrie Boyce ZL-425
(Licensed Amateurs in Australia are also unable to obtain concessions on receiver imports. The matter is still being pressed... Ed.)

The Editor,
Dear Sir,

I have for some time tried to wage a private war against rising prices of items offered for sale to Amateurs. This was made possible by a number of devices and the fact that I considered this matter to be outside the realm of available consumer products to Amateurs whose workshops lacked metalworking facilities.

It is now necessary to report that this policy cannot be continued indefinitely as new prices, about 1/3rd higher will have to be charged as soon as presently available stocks (four only) of Qud kits and other items are sold.

The need for this action is regretted but, with rapidly rising prices for raw materials of all types, it is impossible for me to maintain prices at present levels.

Syd Clark, VK3ASC

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With Syd Clark, VK3ASC

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●

New Products

Information is to hand on a new range of five multi-voltage, general purpose, power transformers from Ferguson.

Two of the transformers have two independent 0-12-15 Volt windings while the other three have either two 0-28-32.5 or two 0-28-35 volt windings. Outputs from 3 to 70 volts and to 10 amps are available using different arrangements. The 15 volt units are available in 75 VA (2.5 A max per winding) and 120 VA (4 A) while the 35 volt units come in 105 VA (1.5 A), 210 VA (3 A) and 350 VA (5 A).

All except the 120 VA unit are fitted with electrostatic screens and all comply with A.S. C 126.

The sample provided was up to spec, well constructed and easy to use.

This range should prove most versatile and useful for the amateur.

Intruder Watch

with Alf Chandler VK3LC

1536 High Street, Glen Iris, 3146

This month I have a grouch I am getting far too few reports of intruders.

This is not because intruders are not in our bands, but because most Members are apathetic towards reporting them.

That is a very bad show!!

One ray of sunshine has emerged though. On 14150 kHz daily, except Sundays, from about 9 a.m. until 10 a.m. Melbourne time, VK3UC controls a net in which many stations participate, either momentarily or prolonged, and he has agreed that any Member who has heard an intruder and wishes to pass on the news can call in on the net and, either he or myself can take the particulars. This is a great step forward, and I have already had several interesting reports.

Also, another method which I am pursuing, and one that takes the onus off Members writing out reports on the forms supplied, is for Members to telephone me. My number is 50 2558 in Melbourne but please do not ring after 9 p.m. in the evening. When you hear an intruder just take a note of the following: Date and time GMT; Frequency; Mode; Signal strength; Call Sign (if identified) any traffic heard, and if possible the bearing ex your QTH. Also, on first reporting I shall require your type of receiver and its IF frequency, and an indication whether you mind me mentioning your Call sign because I shall wish to sign the form as for yourself per mail.

In Brisbane Murky VK4KX phone No. 35 5385; In Perth Ross VK6DA No. 24 2908; in Adelaide Laith VK6LS No. 276 4742; will take any calls that you wish to make.

Some members seem to think it futile to report intruders. This is far from the truth, and it is to the credit of the WIA Intruder Watch that some stations have been removed from our bands. A notable example is K/S who, by the RTTY radio-station, was identified by a Member as having reported to RSGB who in turn prevailed upon the Yugo-Slav Government through the British Administration and had that station removed.

I may be a little premature, but it is some time since the Indonesian stations 7BDZ etc. on 14080 kHz have been heard. Don't for a moment think that Amateur frequencies are the only ones occupied by intruders. I have been supplied with a page from the document FR692 — "The Board (IFRB) shall prepare periodically, for publication by the Secretary General, summaries of the useful monitoring data received by it including a list of the stations contributing the data". This could side page which is pages 287 and 298 covers from 13602 to 14385 kHz, and is full of intruding stations mostly only identified by country.

An interesting feature is that those identified have similar Call signs to those heard in our bands by Amateur Observers. So you see the necessity for the advantage of reporting those noxious intruders.

Stations reported August through September are as follows —

21313	A1	FLJ — calling FAAG with weather report in French.
14040	A1	calling JPB — stopped when QRMed.
14046	A1	ILAV — Vs. High speed CW
14076	A1	— 5 figure code
14111	F1	— Letter and figure code.
14128	A1	— Letter and figure code.
14131	A1	VUKH — calling 3NH.
14135	A1	VLHU — Vs and ORN, QRZ
14150	A1	DNQO — calling OUNC. 4 letter groups.
14152	F1	— RTTY, 100 baud, 500 shift.
14158	F1	— Letter and figure code.
14184	F1	— RTTY, 500 shift.
14240	A1	ODZB
14253	A3	— Foreign broadcast.
14236	F1	— RTTY, 500 shift.
14324	A1	MYNK — calling 53NI.
3643	A1	— 4 figure code.
3645	A1	AAQJ — calling ODQX.
3648	A1	— 4 figure code.

Contests

with Jim Payne, VK3AZT
Federal Contest Manager,
Box 57, East Melbourne, Vic., 3002

1974 REMEMBRANCE DAY CONTEST RESULTS

	a	b	c	d	e	f
VKS & S	289	637	34.5	1485	71844	26325
VK4/P29	132	775	17	1945	48049	10299
VK8	77	525	14.8	1444	29152	5719
VK1	35	130	26.8	1065	11203	4672
VK2	169	2151	5.1	1522	34524	3271
VK7 & 0	42	231	14.1	705	12003	2688
VK3	89	2054	4.3	1044	30555	2370

a—Logs received d—Average top 5 logs
b—Licences e—Total score
c—Logs/Licences % f—Trophy score

CONGRATULATIONS TO THE VKS & S participants.

Their joint effort was well organised and the repeated cover sheets received with most of their logs made my job much easier. Column "a" of the results shows the call areas where prior organisation might wrest the trophy from VKS. But pity the contest manager, for this time there were 809 logs received and over 200 of them arrived during the two days before entries closed.

Unfortunately a few logs contained less than the minimum 5 contacts and consequently could not be recorded. Several missed the scoring table and claimed highly inflated scores, quite a number failed to double scores for CW contacts, and a surprisingly large number either did not total their score or make any effort to score. Several operators forwarded check logs and some of the top scorers prepared their logs with meticulous care. Generally, the numerous comments referred to a most enjoyable contest but quite a few criticised various aspects which cumulatively ask the question, is it a contest or a QSO party? This column is not the place to record those constructive criticisms and they will be referred to the Executive. The VKT people were very disappointed because repeater contacts were not allowed this time and copies of their comments will be forwarded to their Council for.

Many operators recorded the name of the distant op and one entry, written with pride in the log received from VK4AL/8 shows VK3OW as "Dad".

It had to happen! Operators are allowed logkeepers. As an SWL submitted in the receiving section, a replica of a log entered in the transmitting, phone section, is there any good reason why an SWL should not have an operator?

DIVISIONAL SECTIONAL LEADERS' LOGS ARE SUBJECT TO FURTHER CHECKS

In the following detailed scores the first figures are the points scores and the second contacts made.

RECEIVING (OPEN)

VK2	J. H. Hillard	449	141
VK3	E. Trelo Isaac	828	184
VK4	J. O'Sullivan	442	172
VK5	R. Wilford	1554	597
	L. Collins	1137	312
	M. Spooner	1131	408
	M. Wall	922	425
	J. MacDonald	621	228
	T. Warrington	504	304
	R. Chester	361	129
	G. Fiedemas	288	121
	D. Minchin	254	86
	R. Taylor	40	14
	I. Vickers Green	26	11
VK6	T. McGrath	120	50
	G. Owen	814	249
	R. McIntyre	461	188
	M. Clarke	458	187
VK7	P. Hall	813	387
	P. Everett	638	281

STATE SCORES

VK1									
GB	1164	438	JG	128	40	TH	41	30	
RA	953	229	ZAR	98	80	KW	30	30	
ZT	467	227	RY	99	56	RL	13	8	
TR	436	201	TJ	82	18	ML	11	11	
LF	424	139	MF	76	57	PF	8	8	
CT	239	98	GR	61	57	JM	8	8	
DV	213	90	AN	58	40	RD/4	759	260	
BA	181	102	DS	53	53				
WI	138	112	ZMV	43	43				

Open									
DA	1304	517	DC	722	318	ACA	94	19	
ADP	1193	487	EP	635	278	YR	46	43	
BAC	1026	405	VP	175	175				
MBS	929	376	AU	194	55				

VK2									
XD	815	585	AWN	254	90	BXG	52	10	
XT	1545	911	OW	248	82	AKV	47	9	
BD	1530	519	BSC	242	97	AWX	42	42	
BMS	1111	387	NW	227	78	AMH	41	21	
AJY	948	317	BKE	191	69	BGG	40	40	
BDT	889	307	BMX	190	83	ALM	38	8	
ABA	784	308	AZY	173	89	ALV	38	15	
AGF	754	235	BRU	158	58	ANL	38	12	
ZM	731	230	AJX	151	56	AGS	35	10	
CH	705	231	BGA	150	53	FJ	31	22	
VU	611	185	AO	127	51	YAO	29	29	
BIU	575	210	ZCT	125	125	QC	27	12	
BML	538	211	BSD	122	30	YCC	26	26	
AJH	431	126	ASJ	117	40	QC	20	11	
BDN	344	118	ADL	114	34	ADR	20	9	
ASH	343	120	SW	110	48	AXS	25	14	
AGM	339	126	LV	103	21	BJK	23	14	
ALX	336	100	YCK	99	99	HZ	21	10	
L8	332	109	ZBG	84	84	ZZX	19	19	
SB	307	100	ZVN	82	82	AEB	19	17	
ABC	301	98	AFB	79	79	ZVJ	16	8	
GPS	282	108	FJ	78	34	QED	13	5	
GS	280	90	AAI	71	32	YBV	11	11	
CV	277	83	CI	66	68	ZYY	10	10	
AJL	275	97	AAC	63	12	YCA	8	8	
RX	260	108	BHS	54	21				

Open									
CA	1703	504	PH	619	144	BET	72	20	
BAX	1335	401	AWQ	444	120	AO	60	7	
ATT	792	168	BCC	254	50	AHM	58	21	
BLK	784	186	AJO	232	55				
CW									
CL	1408	248	GR	270	52	AJX	128	20	
GX	1034	159	ANY	212	40	JOY	118	26	
HW	786	125	HQ	204	50	TR	90	25	
BHO	710	145	BHL	200	43	IV	90	16	
BQG	652	120	KA	179	41	AMB	85	19	
ADW	606	112	SI	144	31	ZC	38	10	
VW	459	79	VM	144	25	PLJ	34	8	

VK3									
AFW	1127	500	BFN	313	154	WM	183	47	
BOL	1118	553	KK	260	114	AJR	129	51	
AYF	1066	525	ZD	287	123	ZBM	128	128	
HT	1009	487	DC	260	121	BKW	122	121	
AUQ	845	461	ASB	250	101	AJP	122	52	
ADW	732	308	VO	250	108	BLM	112	55	
ARV	780	355	BMA	244	153	YHS	103	103	
AJY	744	336	KJ	244	117	BJB	95	42	
SM	722	301	OY	238	93	ZBB	51	51	
AMN	656	341	ZY	233	100	NY	51	25	
QJ	583	244	AOLJ	227	104	ZRG	44	44	
YQ	536	250	PV	220	104	AJP	31	17	
YQ	548	206	AKG	214	114	BAX	27	16	
FR	517	217	HZ	214	110	ZZU	22	22	
AGM	487	252	AVJ	207	122	ZSC	18	18	
WV	469	220	IC	190	112	ARA	15	7	
AFJ	387	176	ZLM	189	189	VFL	9	9	
AMP	376	144	YB	188	80	AKT	9	8	
SP	372	194	LV	163	63	ORB	7	7	
OZ	353	154	UW	178	67	YDA	6	6	
AAD	320	155	BAZ	173	67	ZPM	5	5	
Open									
AYL	865	481	QP	635	225	EZ	148	71	
AQO	673	422	VF	268	180				
WW	647	445	PR	242	107				

CW									
OP	714	180	JI	442	112	GK	100	24	
CM	672	185	YK	320	70	TJ	82	24	
FC	638	181	NK	266	68	ABR	82	22	
ZO	584	142	RJ	254	74	AJB	74	24	
AMU	582	180	ARK	542	73	BDH	18	7	
MJ	506	118	ATZ	222	55				
MR	448	118	ABS	152	50				

VK4									
Phone									
ZU	2113	785	GI	217	85	ZDB	60	60	
VU	1365	478	CY	216	93	ZUA	58	58	
Y5	1187	439	RO	200	86	ZGR	57	57	
OW	871	349	LM	198	81	ZNH	57	57	
NO	870	310	NO	181	81	FE	55	55	
DO	870	310	OW	184	60	XN	50	12	
FD	741	285	ZBV	181	81	KZ	48	18	
CP	721	255	PU	178	50	NG	48	12	
ZB	702	218	ZRF	173	173	2TK	38	38	
VU	688	243	Z.C	168	168	ZA	35	35	
EZ	629	227	NV	158	53	UB	33	10	
KS	635	208	ZW	153	67	ZAF	29	29	
LE	633	208	NY	158	52	ZRP	28	28	
OO	614	220	WIG	137	48	ZNI	26	26	
PC	589	200	XZ	134	71	ZLD	25	25	
MMW	562	178	LR	134	40	TL	22	10	
HS	548	149	BO	133	50	OW	18	10	
H4	514	124	H2	118	33	VS	22	6	
PJ	400	117	ZML	113	112	ZFA	18	18	
FJ	377	118	AM	88	52	MU	18	10	
GS	371	125	VL	98	38	SR	17	17	
EM	349	122	ZZ	92	32	ZRI	17	17	
PH	342	110	AO	88	35	ZJM	15	15	
WM	309	108	NV	83	33	OT	14	8	
IC	299	147	GR	82	34	UJ	12	12	
UC	289	121	ZDC	81	81	ZRG	11	11	
GM	278	157	DV	75	31	ZDQ	11	11	
AJ	267	150	ZEZ	71	71	ZMD	9	9	
QJ	250	93	ZJO	67	67	ZEK	8	8	
QZ	247	73	LA	66	30	AL/B	292	100	
QJ	237	64	EH	64	43				
UJ	217	101	AZ	61	22				

Open									
IM	2386	668	WL	678	122	PV	333	109	
RI	1996	618	PS	655	217	JY	285	91	
UX	1908	603	LZ	643	236	IJ	208	89	
HE	1787	504	NP	831	173	QH	81	26	
LT	1291	363	VB	810	144	UQ	80	23	
UA	1055	287	UL	588	148	CB	48	16	
KI	785	187	AK	380	114				

CW									
CK	982	158	HH	252	50	OK	104	20	
UR	842	110	MY	220	38	CN	82	15	
KU	492	87	CU	218	52				
FB	416	78	VA	138	30				

VK5								
OK	1557	618	MF	555	184	WB	307	140
BW	1448	593	DI	542	167	SS	307	100
BI	1387	467	US	532	192	ZU	306	93
NC	1318	447	VX	511	149	IZ	304	118
FT	1233	442	LL	507	202	NY	301	131
NT	1228	513	KR	488	222	FR	294	100
BT	1186	438	VT	486	311	XI	278	123
PH	1041	594	TY	485	235	SO	269	00
CM	901	409	WR	483	181	CH	262	00
HI	898	360	NJ	477	174	AWJ	259	122
GM	858	253	ZGZ	453	453	XU	246	78
WI	844	337	BQ	453	190	KX	239	173
BT	783	287	AV	445	271	AI	237	123
OV	767	270	DK	442	158	HN	235	120
LI	749	258	QJ	433	150	NX	211	92
ZT	747	330	GL	427	304	ZQ	200	004
ZK	741	320	QJ	422	138	PF	194	039
FD	735	259	OH	418	170	BF	184	58
BT	730	252	QV	405	150	PH	180	00
ST	700	265	UV	388	140	ZCP	172	172
NN	682	236	AX	372	144	ZMF	172	722
ZZ	678	233	LN	357	119	TL	184	50
VB	634	227	ZDO	353	353	ZAC	181	161
NB	629	274	GV	347	115	FL	158	43
BT	629	243	QV	347	115	FL	158	43
EX	611	231	UC	342	100	JD	153	69
MG	589	216	KG	317	129	AF	153	55
MM	561	220	GN	312	104	ZCR	150	150

BD	160	48	AS	68	42	PS	24	24
ZJV	148	148	ZNJ	67	67	WW	24	14
ZE	148	62	FA	61	61	ZB	22	9
WN	141	79	JO	63	30	ZWE	22	22
AH	140	41	EQ	63	21	ZKP	22	22
OZ	139	50	ZKS	60	60	ZMR	22	22
KH	138	65	OE	60	30	ZTK	20	20
TW	136	60	ZCV	56	56	VH	20	7
MT	131	62	QZ	56	21	ZTT	18	18
PO	131	38	ZOL	53	53	UL	19	12
JU	129	61	GX	62	62	WA	19	5
SD	128	37	TU	61	31	ZOO	18	18
CL	123	74	ME	61	30	ZL	17	10
HW	123	40	OO	30	25	WD	17	6
ZKJ	121	121	ON	30	18	ZAH	16	16
ZN	118	118	ZIG	46	46	RS	16	10
AL	118	30	GO	46	46	BA	16	8
BS	113	33	ZAR	48	48	ZY	16	8
ZAJ	110	110	ZBC	47	47	ES	16	5
KF	108	48	LW	47	24	UA	16	5
QO	108	38	IR	46	48	TX	15	15
ID	107	32	ZHF	45	45	ZSJ	15	15
SR	104	38	WK	45	22	ZZX	15	15
DE	104	30	QP	44	22	CQ	14	14
ZB	102	83	LQ	41	41	JN	14	14
QF	102	30	ZDT	41	41	ZPK	14	14
AG	102	30	PB	40	20	ZWC	14	14
JA	100	64	WM	34	12	ZHB	13	13
XY	99	46	ZJF	36	36	ZLH	13	13
PL	99	39	ES	37	31	ZLA	12	12
DP	97	32	IS	36	11	ZAQ	12	12
H	96	29	OT	36	11	ZTX	12	12
KT	96	29	ZKT	34	34	ZDI	10	10
QW	96	29	ZK	34	34	ZLO	10	10
PI	94	30	ZIM	32	32	LK	9	9
HH	91	33	KW	32	10	ZNN	9	9
TO	88	37	ZJM	31	31	AN	8	8
QW	88	30	UN	31	9	ZPM	8	8
PR	88	28	ZEF	30	30	ZIS	8	8
ZV	88	27	ZJA	30	30	BT	8	8
LC	83	35	ZLK	30	30	PG	7	7
LO	83	26	ZPP	30	30	CJ	6	6
IM	82	31	ZAW	29	29	MK	6	6
HD	80	20	ZAT	28	28	ML	6	6
QY	79	30	RW	28	13	CP	6	6
ZNJ	78	75	MB	27	9	ZMK	6	6
RY	76	21	ZHR	26	26	JF	6	6
OG	75	38	DO	26	9	RL	5	5
QZ	74	74	ZBM	25	25	OV/4	81	31
PQ	74	32	ZPB	25	25			
JE	69	30	RP	25	14			

Open	1875	555	QI	679	136	RI	178	63
RO	1337	353	RC	486	146	MA	15	8
BO	778	262	RR	279	106	CO	103	45
XX	656	296	HM	267	76			

CR	950	170	KU	400	62	DS	58	10
OR	800	175	ZX	312	60	YJ	56	12
OR	896	172	AO	296	49	GK	34	10
OR	758	143	LD	190	40	LB	30	10
MO	676	127	LR	172	25	JG	26	8
FM	598	117	DW	180	41	RM	26	8
IF	486	100	KQ	166	30	PE	20	7
CB	484	95	XD	166	28	VC	20	7
KJ	450	95	DL	110	27	UE	19	5
NM	436	97	TL	104	20			
FY	424	85	HO	84	25			

VKS Phone	1763	700	EB	276	111	WI	121	108
AO	1235	600	GR	258	95	SH	112	112
AO	1076	412	DT	258	105	ZGZ	108	108
RY	1048	484	AN	234	152	KC	106	34
WC	890	405	GL	226	90	CO	103	45
CA	862	452	DZ	220	86	TU	96	37
KW	932	364	ZIW	208	208	CW	87	49
VP	778	284	VK	180	82	TZ	75	72
JK	739	287	ZHJ	170	176	KJ	72	35
KJ	668	253	VP	172	62	MM	68	68
PH	598	205	PH	164	67	PH	68	68
NM	558	213	DY	161	84	TL	66	21
BD	550	203	HE	161	82	CN	59	37
VW	495	202	WL	154	58	ML	51	15
LG	498	100	HU	142	141	HT	45	19
KB	485	254	BF	136	120	ZCN	40	40
JY	424	182	MY	125	53	XK	38	10

ZKY	34	34	CO	22	9	JO	8	8
LE	29	11	AWI	19	19	RD/8	27	9
OR	25	12	NE	19	19			
NA	25	6	ZDF	10	10			

Item	2073	722	NK	557	167	RL	230	71
RT	1294	455	Z2	537	191	16X	212	61
MA	1196	426	EJ	401	163	CR	106	32
ZE	926	215	QJ	286	127			
FI	713	249	EG	282	110			

CW	1106	218	GA	86	20			
JF	618	132	HD	24	6			

VK7								
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KR	676	442	GJ	251	75	BF	99	20
KJ	659	256	EB	238	117	FB	98	27
NR	570	203	ZIF	194	194	ZJG	61	61
MX	567	248	OA	148	70	ZDA	36	36
LH	547	243	Bm	127	90	ZIE	29	29
KH	544	200	CP	112	87	ZAD	26	26
MZ	505	138	OE	91	54	ZWK	24	24
AX	483	348	ZBY	84	84	ZLD	23	23
GW	481	110	ZQG	76	76	TT	8	8
OH	367	164	LY	74	29	ZMF	6	6
JU	286	144	DW	73	32			

ZZ	368	133	AL	245	66			
HE	340	91	PF	133	66			

CW	872	171	RY	300	84	RL	12	6
RO	712	169	RK	62	21			

VKA								
AB	1066	363	CEB	248	61	88	33	13
AB	626	171	CEG	179	68			
A2	291	63	RZ	144	71			

Open	1299	638	JB	348	153	AJ	166	71
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CW								
MA	368	68						

VKS								
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MX	1038	176	DM	273	48			
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Phone								
DJ	1479	440	DM	577	207	CA	318	102

ZL								
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1BKU	948	475	2AUS	726	341	352	1119	306
AGO	179	75	GJ	644	320			

QW	798	390	SABC	812	214			
2KX	450	194	ACP	1920	422			

CW								
4BE	944	103	1BJH	242	87			

ROSE HULL MEMORIAL VHF-UHF CONTEST								
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1974/75								
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The rules were set out in last month's issue of AR. It is in the best interests of Amateur Radio to be as active as possible in these parts of the spectrum so join in if you can, please.

ROSE HULL MEMORIAL VHF-UHF CONTEST

It is only 3 months off so how about trying out your car's alternator on the lawn mower motor incidentally, David VICAKO made 214 contacts during the RD contest using 2 watts F3 on 52 and 146 MHz.

CONTEST CALENDAR

Nov 10	Czechoslovakian
Nov 16/17	ARRL Phone Sweepstakes
Nov 23/24	CQ WW DX CW
Nov 30	10 metre ground wave test
Dec 7/8	Top CW
Dec 7	Ross Hull Memorial
Dec 14/15	ARRL 10 metre

MAN GMT Sat Nov 10 to 2400 GMT
Phone and CW all bands

Categories: Single op, both single and all band.
Multi op all band only

Scoring: One point per qso, 3 points if with Czech sin. Multiply total by sum of ITU zones worked on each band. Certs to top scorers in each category in each country. Logs to Central Radio Club Box 66, Praha 1, Czechoslovakia by Dec 31st.

PROTEST AUSTRALIS

The following equator crossings are for Oscar 8 "ee" orbits over Australia for November 1974. The satellite is "ee" Monday night, Thursday night Saturday night and Sunday morning local time.

Times given are U.T.C. (Z) but days are local. Figures have been corrected to latest NASA predictions

Orbit No.	Time (Z)	Cross (+W)	Orbit No.	Time (Z)	Cross (+W)
Sat. 2nd			Sat. 19th		
9362	0726.71	190.5	9538	0847.72	160.3
9363	0923.71	188.3	9539	1042.72	209.1
9364	1121.71	218.1	9540	1237.71	237.8
9365	1313.08	246.8	Sun. 17th		
Sun. 2nd			9543	1822.7	324
9368	1858.68	333.1	9544	2017.69	352.8
9369	2053.67	1.3	9546	2212.68	51.5
9370	2248.67	30.8	9548	0007.68	20.3
Mon. 4th			Mon. 18th		
9371	0723.67	159.3	9553	0842.58	179
9388	0916.58	198	9554	1037.58	207.8
9389	1113.58	216.8	9556	1252.57	236.5
9390	1308.58	245.5	Thurs. 21st		
Thurs. 7th			9600	0737.58	182.7
9425	0813.36	171.7	9601	0932.37	191.5
9426	1008.35	200.5	9602	1127.36	220.2
9427	1203.35	229.2	9603	1322.36	249
9428	1458.34	258	Sat. 23rd		
Sat. 9th			9625	0732.24	181.4
9450	0808.22	170.4	9626	0827.23	190.2
9451	1003.21	199.2	9627	1122.22	218.9
9452	1158.21	227.9	9628	1317.21	247.7
9453	1353.2	256.7	Sun. 24th		
Sun. 10th			9631	1903.8	338.8
9455	1743.19	314.2	9632	2052.19	3.7
9456	1838.18	342.9	9633	2252.19	21.4
9457	2133.16	11.7	Mon. 25th		
9458	2328.17	40.4	9650	0727.1	180.1
Mon. 11th			9651	0922.09	185.9
9459	0903.08	168.1	9652	1117.08	217.6
9476	0958.07	197.9	9653	1312.08	248.4
9477	1153.07	226.8	Thurs. 28th		
9478	1348.06	255.4	9658	0816.08	172.8
Thurs. 14th			9659	1011.08	201.3
9513	0852.96	181.8	9659	1206.07	230.1
9515	1047.96	210.3	Sat. 30th		
9515	1242.95	239.1	9713	0814.74	171.3
			9714	1001.74	200
			9715	1201.73	228.6

Forreston, S.A. 6235
Times: GMT

ATEUR BAND BEACONS

AMATEUR BAND BEAGONS

VK0	VK0R5A, Macquarie Island	52 980
	VK0MA, Mawson	53 100
	VK0GR, Casey	33 200
VK1	VK1RTA, Canberra	144 478
VK2	VK2R, Sydney	52 450
	VK2WI, Sydney	144 101
VK3	VK3RTG, Vermont	144 765
VK4	VK4RTL, Townsville	52 608
VK5	VK4WJ1, Mt. Mowbrall	144 405
	VK5V, Lofly	53 000
	VK5VF, Mt. Lofly	144 800
VK6	VK6VF, Perth	62 301
	VK6RTU, Kelgoorlie	52 340
	VK6RTT, Carnarvon	52 900
	VK6RTW, Albany	144 600
	VK6VF, Perth	145 000
VK7	VK7RTX, Devonport	144 800
VK8	VK8VF, Darwin	52 100
P29	P29DA, Los. Nugini	82 265
	JA14YU1, Tokyo, Japan	52 500
	3D3AA, Suva, Fiji	52 500
ZL1	ZL1VHF, Auckland	145 100
	ZL1VHW, Waikato	145 150
ZL2	ZL2VHF, Wellington	145 200
ZL3	ZL3VHF, Palmerston North	145 250
ZL4	ZL4VHF, Christchurch	145 300
ZL5	ZL5VHF, Dunedin	145 350

Band operational news being rather scarce this month, I feel it is just as or more important to give you a couple of reprints this month to help you with your digestion. They are very relevant, and very important, I think you should read on. The first comes from the QRT edition of "The Victorian VHFer" being the editorial by Mike Goode, VK3BDL . . .

"Button pushing" idealises in many respects the

"Admittedly, in some respects, today's carphones are similar to the 522 sets of yesteryear, however, one fears many amateurs may never wish to operate anything more than what is really a glorified telephone (a function which it satisfies well), as contacts are so easy to obtain. Additionally, the repeater systems are often abused by people pushing sub-standard signals through the device, despite the consequent poor reports from other operators.

"Amateurs were originally those who developed and experimented with new radio communication techniques. In today's society, such is quite impossible because of the commercial exploitation of wireless that followed the initial development. However, amateurs are still the exponents of propagation effects and there are many keen experimentalists in this field, e.g. moonbouncing, and meteor scatter. Amateurs are also providing mobile

"It is time for us to lobby together, and discuss the 2 metre band problem at clubs, over the air and to our local member of Parliament. It is ridiculous for a 'young country' like ours to have two changes, from the original TV system in 16 years... and what is next? UHF? All local TV manufacturers have been advised to provide switching for UHF converters for future installation... A further TV frequency change? The best TV system proposed to date, some-

Finally, before the subject is changed, it surprises me to note the number of amateurs originally considered dyed-in-the-wool VHF types who, when the full licence is obtained, simply take up appliance operation on the HF bands. There is room on our bands for all kinds of operators but don't let any of us become too narrow in our operating circle.

Despite my requests for information of proposed portable operation during the Christmas-New Year break, nothing has reached my desk, so presumably no one is going out except me. Ah! Wait! I guess I can't go out with my portable because of the lack of working other portable stations during these periods of coastal ducting and inversions. However, not quite all is lost, as Kerry VK8SD did write to me some information on proposed portable operation from Ceduna. Kerry VK8SD says Kerry advises the VHF beams are being rebuilt or overhauled. On 6 metres he will run CW/SSB 40 watts PEP output, AM/FM 20 watts output. Ailce VK8SD will run 40 w. e. yagi, 20 w. e. 2 m. and 10 w. e. 11 e. yagi at 90 feet. He mentions that even with this low power he was successful in working to Sydney and Canberra last year. FM 10 watts at 87 feet, and will have available Repeaters New 1, 2, 3, 4. Old Ch. B. New Channel 50. He will be looking for contacts through the Adelaide and Albany repeaters, and further afield if possible. FM 10 watts at 87 feet. He will be at home, and amateurs passing through Ceduna would be welcome. Thanks Kerry, for all the trouble of writing. Would be pleased to hear from you

A letter from Ben VK4ZLC, Publicity Officer of the Tuggerah Amateur Radio Club, indicates the repeater is progressing slowly. They are hoping to be allocated Ch. 1. The Club has been busy holding rallies, dinner dances etc. to raise funds for the repeater. It is hoped to site the repeater on Mt Stuart, alongside the TV stations. Mt Stuart is situated about 5 miles west of the town with a

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Ferrules Adaptors. 350 ft 0.064 Hard
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whit. or 3/8 in. UNF thread
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\$2.00

\$10.00

S. T. CLARK

P.O. BOX 45, ROSANNA

VIC., 3084

Ph.: 45-3002

good lookout both north and south and only slight reduction in coverage to the west. Present proposals are for a 25 watts solid state repeater possibly more power later.
About 35 amateurs are now capable of radiating on Ch. 80 in the Townsville area and the majority also operate on Ch. 40. On 8 metres local nets are on 55.022 Sunday mornings, while Ross VK4RO at Ayr (30 miles south) and Mario VK4ZMS (70 miles north) have regular sittings on 52.010 SSB. It is hoped there will be some signals available on 144 MHz for the coming DX season, as this may be the last opportunity for a while (due to propagation) or forever (if we lose 144-148) of working the northern VK4 boys from the southern states.

THE VICTORIAN VHFer

The "QRT" edition of the above reached my desk recently. Very sorry indeed to see it go. It has contained a wealth of information on within its pages in its rather short life. Reasons given are lack of suitable articles, rising printing and paper costs, and postal charges. All valid points. Originally the brainchild of Bob VK3ADT, that great exponent of the art of VHF, and later carried on by Ian VK3YAY, and supported by all too few at the working end, I am sure all will regret the demise of such a worthwhile contribution to the VHF scene. May I voice my lone thanks to those associated with its production, and mention I still have on file every copy of the "VHFer". And they will be kept for the future. A job well done, boys.

Similarly, looks like some production difficulties for the Sydney based publication "GUP". Issues have been few and far between of late, again I expect for the same reasons in Victoria. All too few willing to help with production costs high etc., changing home demands of already overworked personnel and so on. However, hope you can keep going for the time being Roger, VK2ZTB, your style is different, and you don't mind being controversial, certainly no yes man!

While on the subject of publications, once again I thank all those clubs and public officers who continue to send me copies of their newsletter with such regularity. Although I don't write back personally, there just isn't time at present, believe

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me, their receipt is appreciated, and I feel it would be a sorry day when they ceased to arrive.

Their's probably enough for this month, looks like a few grooches aired etc. but all in a good cause. I could add more, but won't. Closing with the thought for the month "We have too many people who live without working, and we have a sledge too many who work without living". And you hear about the translator-radio manufacturer — he's so outstandingly successful he's looking for the smaller premises!

The Voice in the Hills.

Awards Column

with BRIAN AUSTIN VK5CA
P.O. Box 74, Griffin SA 5152

ITU "DIPLOME DES 100" AWARD

Secretary General M. Mill of the International Telecommunication Union has announced the establishment of an award for radio amateurs and shortwave listeners in recognition of their efforts to promote international goodwill through amateur radio. Known as the "Diplome des 100", the award will be given to any amateur who submits proof of contact with stations in 100 different member-countries of the ITU, or to any SWL who proves reception of amateur stations in same. Only contacts made on or after January 1, 1987, or after a country's ratification or accession to the Montreux convention, whichever is later, may be counted.

Only stations using frequencies, emission modes, and call signs which are in accordance with the ITU Radio Regulations may be logged or contacted for purposes of this award. There will be no endorsements for special conditions, but stickers will be given for each ten additional Administrations contacted or logged.

Administration of this award has been delegated to the International Amateur Radio Club (IARC), Geneva. Requests for further details should not be sent to Geneva but should be mailed, with a self-addressed stamped envelope, to the IARC Award

Manager L. M. Rundlett K4ZA, 206 East Amhurst St. Sterling Park, VA 22170. The application fee is 10 IRCs or \$2.

DIPLOME 35 (AHCI)

The Section 35 (file at Vlain, of REF, France, issues this certificate to licensed amateurs and SWLs all over the world.

1. Licensed amateurs need contact with five different stations located in the department 35, file at Vlain, France.
2. SWLs need send reports to 5 stations as above. The Award is issued separately for (a) HF bands and (b) VHF bands. Contacts may be made using any mode of transmission.

An exchange of RS(T) and QTH is obligatory. Contacts with mobile-portable stations located in department 35 are valid provided their exact location is indicated on the QSL cards.

QSL cards are not required to be submitted. Licensed amateurs apply with a copy of the station log, signed by the applicant SWLs apply by enclosing a copy of their SWL licence and the QSL cards to the 5 stations of department 35. Cost: 5 IRCs.

These rules are valid as from January 1989.

Address for the application
Jean Yves Rioult F5JLJ
11 Square des Provinces
35 - Rennes France

DVLT CERTIFICATE

A certificate is now available for those persons showing proof of contact with YLs in the GERMAN FEDERAL REPUBLIC. The requirements are DX stations outside EUROPE work 10 women amateur radio operators with a licence of the German Federal Republic. A QSL of a YL working at a club station (DXD or DLG) counts extra. If the QSL and the persons QSL of the YL show different dates All bands and all modes of emission are acceptable. This award is available to SWLs as well as amateur radio operators. Stickers are awarded for each additional 10 contacts. Send GQR/VL together with 10 IRCs, or equivalent stamps of your own country, to the custodian Ursula Burger, 12 Furzberger Str., 563 Ranscheid, Germany/Europe.

This award will be sent by airmail.

Hamads

FOR SALE

AWA MTRC-60, complete with Ch. 8, \$55 O.N.O. **Hebrew HF AM Transceiver**, x'tal loaded, suitable for 160 meters \$10. **Complete Microwave duplex system** comprising of two units, fully tunable and ready to operate parts, \$110. **VK3ZOP**, 34 Sandy St., Middle Brighton, Vic. 3188. Ph. (03) 82 5667 A.H.

Delcoe 6222TR AM-CW 80-10 metre Tx with hand-book, \$75. 20 foot dual rail supporting portable **Mael** in canvas bag, \$8. **Power** and audio trans-formers, tuning dies, power supplies, valves, HT chokes, blowers amplifiers tuning capacitors, and other oddment parts for best reasonable offer. **VK3UG** QTHR Ph. (03) 231 2028 after 7 p.m.

HAM-10 Repeater, as new \$120. **Meat 60** 10 — S section, but on type by Hills, \$50. **Teleprinter** **Cred** 70 good working order, \$30. **Power Supply** — 500V/500mA stabilized. **Dura** tubing, various diameters and anghs. **Pyre Mark 3**, converted to 6m. **3API C.R.O.** tube **VKNE** QTHR Ph. (03) 25 3840 nght.

Yasu Station, consisting of FTD-400 with 40 C.F.M. fan attached, and spare SKDAs. FTD-400 VFO, 67V 650 and 8200, matching speaker \$550, but open to any reasonable offer with sell separate units to sell **VKNE** QTHR Ph. (03) 42 3232.

Hamsters 5X 117 Rk — HT 44 Tx — P.S. and speaker 60-10. **SSB-CW-AM** VOX-PT 120 **PEP** Good condition. All new valves and new spare 60DS Fns, \$320 or offer. **L.A. Lawson** 77 Hill Ave., Burleigh Heads. 4220. Ph. (075) 35 2659 day.

Trio TR8E 144-148 MHz AM Transceiver 240W/12V P.S. Inbuilt, separate VFOs for Tx/Rx, also xtal locked 1 xtal for Tx 144.25 MHz, **Mail** hand-book, good condition, \$150. **ONO** VK7ZDA, 65 Brougham St. West Launceston, Tas. 7250. Ph. (003) 31 8643.

Drake TR4 Transceiver with AC P.S. Excellent condition with mixer speaker. Spare set Fins. Tubes **VK2AGO** QTHR, Ph. (02) 43 2427.

Galaxy 5 Transceiver SSB 80, 40, 20, 15 20-30 complete with P.S., 60V, 650 mA, 8200, full circuit, very good condition, \$350. **ONO** VK3FO QTHR Ph. (054) 75 2245, AH (054) 2378.

Pyre 6 MHz xtal linear with carrier xtal \$25. **Collins** VFO 75A series, \$20. **Pyre Reporter** 530.5 MHz AM Tx CR, 15.5. **Collins** 53052 MHz TXCR, \$10. **TCA** FM 100 W base, \$40. **100W Zero Bias** 807A Modulator, \$40. **PSU** 500V 800V (1000 mA), \$40. **Several** **General** **Receivers**, \$15 each. **3.5 MHz** **Receiver**, \$10. **Tx**, 3.5-30 MHz **CA**, **150W**, built-in PSU (all used on CW) "mini mixer" VFO **M/bands** \$55. **WIA** 6 and 2 metre converters with xtal for M/band, \$30. 3 as new 4C x 250W **Valves** and 1 only secondhand one, \$30 the lot. 1 pair **PT 23** high voltage **Binary** Transceivers, 1 watt, 2 channels, 900. **RCA** 14 in portable Tx, \$70. **A. Greening**, VK3WU, 57 Glen St., Glenroy, Vic. AH (03) 308 2039.

Pyre Ranger FM Transceiver, converted to 2m with channel 8 xtal, FET preamp, ex VK3TR, in working condition. \$50. **H. Trotter** 133 Dalton Rd., Thomastown, Vic. 3077.

Transmitters 2 of AT14 100W AM, 2 of 813 P, 2 of 808 model 2-20 MHz, 2 of AMT300 300W AM, 1-6-10 MHz, 2 of QV3/125 P, 2 of QV3/125 model, all recently operating RFDS, suitable linears or bits; also transformer 240-7 KVCT 8.8A, and HV chokes 0.6A. Offers to VK4OH, 20 Alfred St., Charleville, Q. 4470.

Auction Sale Night, Moorabbin & District Radio Club, 1100 Moorabbin Rd., Moorabbin, 19th Nov. 1984, at the Moorabbin baseball clubroom, "Summit" Ave., Moorabbin, at 8 p.m. Quantity, new and slightly used VHF and UHF FM solid state mobiles and portables. Enquiries to Treasurer John Emery, VK3YTC, Ph. (03) 783 6003 AH.

AWA MTRC-60 with xtal, \$525. **3MHz**, \$100. **2MW** AMTR with xtal, \$600. **1A**, \$120. **Pyre** **MK11A** with xtal for 50.5 MHz, \$12. **Complete** set of RF & IF coils for AR680, what offers? **VK2AJX**, QTHR Ph. (02) 798 9021.

FT200/FF100 combination with xtal for 28.0 and 27.0. Installed smart black fascia, 12 months old and new, \$270. **VK2BBD** Ph. (02) 936 7215.

ESTATE LATE VK2ABU, 40 R. 3 leg gal steel tower complete with prop, pitch motor, motor mounting plate with Selsyn motor attached, 20 ft 2" drive shaft gal pipe, top bearing, slide ladder, platform mounts, 8 ft x 2" heavy aluminium twin boom, duralumin tubing. This tower will support any beam \$165 O.N.O. **VK2AFN**, QTHR Ph. (02) 78 9525.

SWAN 330 SSB Transceiver with DC and AC P.S. in excellent condition with manual VOX xtal calibrator, \$320. **VK2ABU**, QTHR Ph. (02) 212 1623. **AH**; or 32 5915 Bus.

FT107B, new in caron, used 3 times only, \$470. **P. Gibson** (P29LL), Flat 104, 150 Mill Point, South Perth.

Pyre 2Mx Carphone, com. to SS cha A, B, C 1 and 4 (old) Boards to 25W. Plus untried 50W board. **Needed** attention, \$120. **AWA MTRC** SS PSU, all cables etc. ch 4 (old) and B. \$45. **Kingsley** AR-7 HF Rx, all coil boxes with PSU, \$65. **No. 18** Calibrator, \$10. **VK3YGY** Box 41, P.O. Castlemaine 3450.

LEN KP262 2 metre transceiver, \$120. **Ch B**, 1, 4, 44.88, 144.8. 10 watt amp to suit above, \$20. **VK2ZSC**, QTHR Ph. (02) 85-5324.

Channel 1 xtal for MFG etc, \$10.00. **Wanted** xtal for Channel 2. **VK3TG**, 2 Willow Cir., Kyabram 3620. Ph. (058) 52 1538.

Collins 7853 Rx mint condition, unmodified. **Wile** used \$550 O.N.O. also antennas TH3 and 18AVO **VK3ARD**, QTHR, Ph. (03) 277 3054 A.M.

WANTED

14 AVQ in good condition. Part exchange 4 band, 3 element "mini beam" in good condition. **VK2BBD** Ph. (02) 936 7215.

Amateur band or General coverage Rx, write R. Jacob, 429 Kooft St., Lavington, N.S.W.

FT200/FP200 combination. Price and particulars to R. Norman, VK5SW QTHR. All replies answered.

GDO with coverage up to 2 metres. **VK3ZTA** QTHR.

Bandpasser, Webster, mobile all band HF antenna. **VK6CR**, 16 Narrung Way, Nollamara, 6081 Ph. (092) 48 3492 AH.

18 AVT vertical of similar Price etc. to VK3YGY Box 41, P.O. Castlemaine 3450.

20 Years Ago

with Ron Fisher VK3OM

NOVEMBER 1964

"Should We Hold a Region III Congress" The Institute was fast becoming aware of the need for an international approach to the problems facing the Amateur Service Even in 1964 intruders in the exclusive amateur bands were common. The battle continues today. The question of reporting modulation quality was one that came up from time to time. With the RST system firmly established by this time, an RSM system was proposed by the RSGB. The "M" was to denote modulation quality on a 1 to 5 basis with "unintelligible modulation at the lower end and 'good modulation, not exceeding 100 per cent' at the other.

Ray Jones VK3RJ in his Federal QSL Bureau Notes reports on one of the most interesting cards he had ever handled. The card from KF3AB located on Fletcher Is (Island in the Arctic, confirmed a QSO with Chas VK3IAC on Macquarie Island. In a letter accompanying the QSL, the writer Lloyd HUI claims that the QSO is a record as, no other pole to pole contacts had previously been made.

Technical articles in November 1964 **Amateur Radio** included "The New Look in Frequency Modulation, part two — the receiver, by John VK2AMT". Part two of the Complete Amateur by Tom Atkins VK4UT also contained a small article, published by a newcomers introduction to serials, and Jack Connor VK3CFC described the "New Over-tone Oscillator Circuit". This was later known as the Robert Dollar circuit.

A "top press" item announced that South Australia has won the 1964 RD contest with Western Australia a close second.

Silent Keys

ERN HODGKINS — VK2EH
FRED ORVED — VK2AHX
The month of July 1974 brought sorrow to the Central Coast Radio Club

First, the passing of Ern VK2EH and in the same week, Fred VK2AHX.

Ern was one of the old-timers and was licensed in 1924 but held one of the early Experimenters Licences prior to that. He spent the greater part of his life in the Technical Education Department and resided on the Central Coast for many years. Wherever Ern went he was active in the Amateur Radio Field and for a number of years operated the more Tapa Service and regularly took his place on the night's Morse practice session on 30 metres.

In this capacity he assisted many present Hams to obtain their licences and gave great pleasure from doing so.

He was a past president of the Central Coast Club and held office of some kind the whole time he was a member. Ern became ill a couple of years ago and had to relinquish a lot of ham activities. He passed away after an operation in Gosford Hospital early in July.

Fred Orved VK2AHX was another of the old brigade, first being licensed in 1927. He was a PMG telegraphist in the early days and later was vice-president of the electrical branch of the department.

Since moving to the Central Coast, Fred was a stalwart member of the Radio Club and always a willing worker.

Although many a DX man Fred was well known on the local scene on VHF since retiring. He was a friend to everyone and his shack door was always open to visitors in true Ham style.

The Central Coast Radio Club will be much the worse for both these members' passing and extend sincere sympathy to their loved ones.

Their calls will no longer be heard — but, they will be remembered.

Dick Maitland, VK2BKK

LEW MACDONALD, VK3WU, age of 29 M. 10-son Street, Charleston, passed away on 31st August 1974 aged 65 years.

Up to the time of his death he was an active member of the Hunter Branch of the NSW Division.

Lew obtained his Amateur Licence on 13th May 1930 and a Broadcast ticket in October 1936. He also obtained a 1st Class Commercial operators certificate in March 1937.

Lew will be remembered by many amateurs for his assistance and instruction in helping others to obtain their Amateur Licence.

To his family and friends, we extend our deepest sympathy.

Ray Laben, Hon. Secretary, Hunter Branch

ALEX STEWART VK2AIF

The many friends of Alex Stewart were sad to hear of his passing away in hospital on 22nd September. Alex first entered radio in 1949, later 1958, 1959, 1960, and later Tullmar, ex VK2XP. He later spent many years in the radio section of Gents but relinquished his call sign when on a long tour of duty overseas. He health ceased his instrument and he came back to the club as VK2AIF. Alex always kept his equipment and two transmitters were sent to parts of the 7 m band, and a short coil generally "raised" him if not already in a net. Many Hams attended his funeral and he will be sadly missed by many who, like myself, have known him many years.

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An unrivalled aerial rotating system for TV or Amateur Radio antennas. With a **STOLLE Automatic Aerial Rotator**, accurate and positive antenna positioning in any direction, is right at your fingertips. This allows you to beam your antenna (for transmission or reception) by simply turning the control knob to the desired position, with a full 360° coverage. A STOLLE rotator is rugged

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MIDLAND 5 W AM 23-channel transceivers complete with PTT mike all channel crystals 12 V DC op.	\$95
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23-channel transceivers, complete with PTT mike etc. 12V DC	\$175

144 MHz TWO METRE EQUIPMENT

MULTI-7 solid state 24 channel FM 12V DC transceivers, 1 and 10W output, receiver with FET rf stage and mixer, equipped with crystals for TEN Australian channels Nos. 40, 42, 44, 46, 48, 50, 54, 56, 58, 60, to be used either transceive or combinations repeaters and ANTI-repeaters, complete with PTT microphone, mounting bracket \$225

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PROJECT AUSTRALIS

STANDARD ORBITS — OSCAR 6

This set of Standard Orbits and the Ascending Nodes (the longitude in degrees West and the time in hours, minutes and seconds, G.M.T., of the satellite's path over the Earth, when it crosses the Equator, travelling into the Northern Hemisphere) is the only information needed to track OSCAR 6. It also allows calculation of when the satellite will be in range of the areas around other State capitals.

The morning (Southbound, at around 0900, local time) orbits over Australia have Ascending Nodes between 80 and 290 degrees West, while the evening (Northbound, at 2100 local time) orbits have Ascending Nodes between 160 and 275 degrees West. As a guide, the morning orbits will have smaller numbers at the start of the "ASCN NODE ADD MINS" column (between 58 and 82 minutes), than the evening orbits (between 86 and 104 minutes).

Ascending Nodes will be transmitted in Morse Code by the Code-store system on OSCAR 6 (29.45 and 435.1 MHz), and will also be announced on the weekly Divisional broadcasts.

If you are in or near Sydney, and want to track a (morning) orbit which has an ascending node of 359 degrees West at 2157 G.M.T., select the closest Standard Orbit from the Sydney set — 360 degrees West. Add 58 minutes to 2157 G.M.T., and you will hear the satellite at 2255 G.M.T. Time, azimuth and elevation points are given every two minutes on the Standard Orbits.

Because the satellite is in an almost circular (1460 Km), near-polar orbit, with each orbit being completed in 115 minutes, given one Ascending Node (say, 330 degrees West at 1905 G.M.T.), later Ascending Nodes can be determined by simply adding the distance in degrees which separates the orbits at the Equator (the Nodal Increment, 28.8 degrees), to 330 and adding 115 minutes to 1095 G.M.T. The result is, in round figures, 359 degrees West at 2157 G.M.T., for the next orbit.

To see whether the orbit which you are tracking in Sydney will be in range of Perth, look at the Perth Standard Orbit which corresponds with the orbit that you are following. If you are tracking an orbit with an Ascending Node of 359 degrees West and are using the 360 degrees West Standard Orbit for Sydney, OSCAR 6 will be in range of Sydney from 58 to 78 minutes after the Ascending Node (2255 to 2315 G.M.T., on the example above), a total of 20 minutes. The same orbit will be in range of Perth from 88 to 78 minutes after the Ascending Node (2305 to 2315 G.M.T.). Therefore, that orbit will be in range of both Sydney and Perth from 2305 to 2315 G.M.T., so that 10 minutes of contact through the satellite will be possible. By selecting an orbit that passes midway between Sydney and Perth (e.g., an Ascending Node of 25 degrees West), contacts of up to 18 minutes are possible. For contact with New Zealand, orbits to the East of Australia should be used, while for contacts into Asia, orbits in the North and West should be used.

Users of Standard Orbits should note that the sets of Southbound Orbits start towards the end of the set (315 degrees West for Sydney) and resume at the beginning of each set (0 degrees West for Sydney), ending near the middle of the set (45 degrees West for Sydney). They are then immediately followed by the first of the Northbound orbits (150 degrees West for Sydney). It was not possible in the short time available after the OSCAR 6 launch rocket was changed to put the Southbound orbits in continuous order.

Assuming a launch at 1715 G.M.T., on 9th. October, the first Ascending Nodes bringing orbits in range of Australia will be —

Orbit 1	324 W at 1842 GMT	9/10/72	Southbound
Orbit 2	353 W at 2037 GMT	9/10/72	Southbound
Orbit 3	22 W at 2232 GMT	9/10/72	Southbound
Orbit 4	50 W at 0028 GMT	10/10/72	Southbound
Orbit 8	166 W at 0809 GMT	10/10/72	Northbound
Orbit 9	194 W at 1004 GMT	10/10/72	Northbound
Orbit 223	W at 1159 GMT	10/10/72	Northbound
Orbit 252	W at 1354 GMT	10/10/72	Northbound

Any change in the OSCAR 6 launch date will alter the times, but not the longitudes of the Ascending Nodes. Any alterations will be notified on Divisional broadcasts.

INSERT WITH AMATEUR RADIO OCTOBER 1972

PERTH

[illegible]

BRISBANE

[illegible]

Economical Mobile/Base Station FT-201



• Solid State 80 thru 10 Meter Transceiver

YAESU now brings you the newest addition to its growing family of Solid State transceivers; the FT-201. Performance and portability are among the key features of this economical

transceiver along with YAESU innovated modules to simplify service and repair. The FT-201 has features which you would expect to find only in units costing much more.

GENERAL

Frequency Range: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz, 28.0-30.0 MHz, WWV 15 MHz (receive only).

Mode: Selectable USB, LSB, CW or AM.

Frequency Stability: Within 100 Hz during any 30 minute period after warm-up. Not more than 100Hz with 10% line voltage variation.

Calibration Accuracy: 2 KHz maximum after 100 KHz calibration.

Backlash: Not more than 50 Hz.

Antenna Impedance: 50 to 75 Ohm unbalanced nominal.

Circuitry: 32 Transistors, 9 FET, 6 Integrated Circuits, 52 Diodes and 3 Tubes.

Power Requirement: 100/110/117/200/220/234 V AC, 50/60 Hz, 380 Watts maximum, or 13.5V DC nominal, 6.7 A for standby, 0.7 A for

receive (Heater OFF) and 24 A for transmit.

Size: 340(W) x 153(H) x 285(D) m/m.

Weight: 15 Kg.

RECEIVER

Sensitivity: 0.3 μ V for 10 dB Noise plus Signal to Noise Ratio on 14 MHz.

Selectivity: 2.4 KHz nominal bandwidth at 6 dB down, 3.8 KHz at 60 dB down on SSB, CW and AM. 600 Hz nominal bandwidth at 6 dB down, 1.2 KHz at 60 dB down with optional CW filter, 600 Hz nominal bandwidth at 6 dB down, 12 KHz at 60 dB down with optional AM filter.

Harmonic & Other Spurious Response: Image Rejection better than 50 dB. Internal Spurious Signal below 1 μ V equivalent to antenna input.

Automatic Gain Control: AGC threshold nominal 6 μ V. Selectable AGC time constant, fast or slow. Fast attack time 3 milli-second and slow attack

time 5 milli-second. Fast release time 0.35 second and slow release time 2 seconds.

Audio Noise Level: Not less than 40 dB below 1 Watt.

Audio Output: 3 Watts to internal or external speaker at 4 Ohm impedance.

Audio Distortion: Less than 10% at 3 Watts output.

TRANSMITTER

Input Power: 280 Watts PEP on SSB, 180 Watts on CW at 50% duty cycle and 80 Watts on AM. (Slightly lower on 10 meter.)

Microphone: 50 K Ohm dynamic type.

Carrier Suppression: -40 dB.

Sideband Suppression: -50 dB.

Spurious Radiation: -40 dB.

Distortion Products: -30 dB.

Frequency Response: 300 Hz to 2700 Hz \pm 3 dB.

Final Tube: 6JS6C x 2.



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